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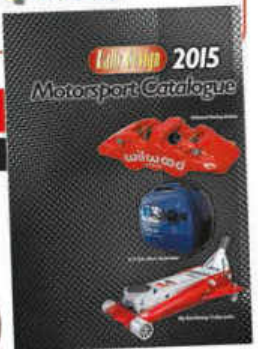


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NEW!  
2015

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'Super Oscar' genuine	each £99.50	£119.40



NEW!  
2015

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WCB, electronic, 18gph	£19.00	£22.80
Facet, electronic, 18gph	£30.00	£36.00
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WCB, interrupter, 20gph	£29.00	£34.80
Facet, silver top, 25gph	£47.00	£56.40
Budget, interrupter, 38gph	£14.30	£17.16
WCB, interrupter, 38gph	£29.00	£34.80
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Trolley jack, H/D, low profile, 3 ton	£229.50	£275.40
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NEW!  
2015

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NEW!  
2015

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NEW!  
2015

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30 LED work light	£16.25	£19.50
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Car creeper, lightweight	£15.90	£19.08
Foot pump - dual cylinder	£14.90	£17.88
Tyre carrier - (4) tyres	£24.92	£29.90



NEW!  
2015

## Garage equipment

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Engine crane, 1 ton, foldable	£129.50	£155.40
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1500lbs engine stand, foldable	£69.50	£83.40
Engine frame, floor stand, pair	£49.50	£59.40
Creeper seat, pneumatic	£23.50	£28.20
Parts washer	£49.50	£59.40



## Blackline professional tools

1/4 socket set, 48pcs	£23.64	£28.37
1/4 & 1/2 socket set, 72pcs	£47.72	£57.26
Service barge tool kit, 99pcs	£68.72	£82.46



NEW!  
2015



# Welcome



Kit car journalist for over 14 years. Built a Sylva Riot and raced a Tiger Avon for several seasons. Has run numerous kit cars as daily drivers over the years.

## THE CKC TEAM

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Andy Bliss

Is this issue just one Cobra replica away from being the perfect mirror of the current kit car market? We all know that Cobras, Sevens and bodykits are the big news in terms of sales volumes, and we have the last two covered by the Nubodi Kalifornia, DNA DN8 and GBS Zero build in this issue. If we'd had a 427 in the mix, we'd have covered all the mainstream (by our standards) bases. People may groan at 'yet another' Cobra or Seven, but the fact remains that people still want to buy them in big numbers. You just need to look at the burgeoning order books of (some of) the companies offering them to understand that they are still where it's at in terms of getting people to sign on the dotted line. Second-hand kit car dealer Total Headturners, who always aims to have 20 Cobra replicas in stock (and currently also has 30 non-Cobra replicas for sale too) tells us that second-hand values have increased in recent years.

For all that, innovation should still be celebrated. To me, it's a tragedy that Morgan Hughes' Rayvolution Evo is the only example of the breed in the UK. You won't see anything like it anywhere other than the kit car scene, and it's cars like this that give me a real kick to be involved in this industry. Such a pity that it didn't get people handing over their cash in the way a Cobra replica does.

'Innovation' might not be a word you would usually apply to a replica, but I place James Grayley's Martin and Walker 356 in the same category as the Rayvolution in terms of offering something different to the norm. While the Speedster replica is a common sight (again, by our standards), the pebble-smooth coupé is something quite

unusual to a kit car enthusiast's eyes. Like Rayvolution, M&W originally only built one coupé when it was first launched in the 1990s, but that has changed since James built his car. Maybe the Rayvolution's time is yet to come. Either way, we will always celebrate variety in the kit car market.

I'd like to take a moment to introduce a new contributor whose name you'll see attached to his first CKC feature in this issue. Chris Pickering studied Motorsport Engineering and Design at the University of Wales Trinity St David before going to spend three years as a development engineer at Ford.

But he always wanted to pursue a career as a motoring writer, and landed a job with *Race Tech* magazine, working his way up to deputy editor. He also pitched the idea of *Historic Racing Technology*, and became that magazine's founding editor. He still contributes heavily to both titles.

So there's no doubting his technical knowledge, but what makes Chris a good fit for us is that he's also a kit car fan. His first car was a Quantum 2+2, and he has since built a Locost chassis (as a practical project for university) and has also owned a Sylva Leader 400 with a Fiat twin-cam engine and a Caterham Seven. His kicks nowadays come from a TVR Chimeara, but he still has the Quantum tucked away at his parents' house.

In his first piece for us, he susses out whether 3D printing is relevant to the kit car industry, and how manufacturers and private individuals could benefit from the technology.

Adam Wilkins, Editor

[@AdamWilkins\\_](#)





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# Something old, something new: Molsheim Type 35 recreation

Here's a clever idea to give older kit cars a new lease of life. The Molsheim Motor Company is buying up a limited number of Replicar Bugatti Type 35 replicas from the 1980s, stripping them back to bare chassis and rebuilding them to a much higher specification. It's a move something similar to the treatment Singer gives to old Porsche 911s, adding value to older machines and making them desirable to a modern audience.

The project is overseen by Replicar founder Alan Hatswell and the marketing is managed by Glenn Renfrew's Lincoln-based Just Classic Cars. The new name helps avoid confusion with the unrelated MEV Replicar.

The Type 35 replicas are still based on Volkswagen Beetle underpinnings, with the chassis prepared by renowned Volkswagen specialists Flatlands Engineering. Aside from that, the cars are assembled with all-new components, including a zero miles 1641cc twin-port engine from VW Heritage. It would be hard to tell just by looking that the engine is concealed in the



boat tail bodywork.

Each car receives a new body, with a much more authentic shape, as well as a host of detail improvements. For instance, they have replica 19in 8-spoke wheels

on Blockley crossply tyres, more period detailing and new interiors. The cars are built bespoke to order with a lead time of around three to four months. "It's completely different to what was offered 30

years ago," says Glenn. The car was first shown to the public at the Lincolnshire County show. Only four cars will be built, each being sold as a complete car from £39,500.

## Xanthos 23 project for sale: Historic racing home wanted

Having been the custodian of the Xanthos Lotus 23 continuation model for a number of years, Kelvin Jones and his

eponymous company are looking to sell the project.

Kelvin Jones Motorsport has worked hard to develop

the Xanthos into its current 'continuation' specification, where the company is able to supply authentic spares to owners of genuine Lotus 23s using the same parts it manufactures for its own car. This brings it back much more to the original concept that founder Henry Tombs set out for the car, before it was taken in a different direction by a subsequent owner.

Having done all the groundwork to bring the car back to its authentic roots, Kelvin feels that the Xanthos needs to be taken on by a company or individual who is proactive within historic racing. That's the reason he is now looking to sell the project.

His company now focuses more on its workshop activities

than running racing cars, and therefore the Xanthos loses out on exposure in front of potential customers. Interestingly, most of the business Kelvin Jones Motorsport currently does with the Xanthos is in the USA – there's certainly room for expansion in the domestic UK market.

Kelvin isn't naming a price for the project, but is instead looking for interested parties to make contact. The sale will include all the jigs and moulds needed to manufacture the car, as well as the Xanthos brand and the goodwill it comes with. He can be called or emailed on 0151 486 7744 or [kj33racer@aol.com](mailto:kj33racer@aol.com) respectively.

[www.kelvinjones-motorsport.com](http://www.kelvinjones-motorsport.com)







## Veranti-Lamberti V3000 prototype on 3500-mile shakedown

Just two days after completing the build of the first Veranti-Lamberti V3000 demonstrator, Neil Sysum took it on almost the biggest shakedown drive you could imagine – a 3500-mile rally through seven countries in eight days, including a lap of the Nürburgring. They were raising money for Cancer Research UK and The Stroke Association *en route*.

The V3000 is a body conversion kit for the Mk3 Mazda MX-5. As is Veranti-Lamberti's usual way, ease of build was in mind during the car's development; the replacement panels either bolt or bond on to the base car.

Of course, the MX-5's mechanicals and interior remain



intact, so it carries over the air conditioning and whatever other equipment the donor comes with. Mechanical options include a 1.8 or 2.0-litre four-cylinder and 5 and 6-speed gearboxes.

The kit price is £3995 and comes with everything needed barring the donor car and lights. There are different grille options available, and Veranti-Lamberti will offer different bumper and bonnet options.

[www.veranti-lamberti.co.uk](http://www.veranti-lamberti.co.uk)



It will be interesting to see how the Molsheim Type 35 is received, and whether a similar programme could be applied to other kit cars.

[www.justclassiccars.co.uk](http://www.justclassiccars.co.uk)

## Will Birkin finally make it in the UK?

There's never been any doubting the quality of the South African-made Birkin; it's a

well-made and attractive example of the (very) Lotus Seven-inspired theme. Since being established in



1983, it has made great in-roads in its home market as well as the USA and Australia. Yet, despite a couple of attempts to crack the UK, it has never taken off here.

Perhaps that's about to change. Terry Ingram and Andy Jordan have set up Birkin Performance Cars UK and will be making their debut at TKC Live at Brands Hatch in November. The key model will be the SS3X with its 175bhp Ford Zetec engine. The £30,900 model will have a 'roadable' spec with full weather gear, heater, heated windscreen and adjustable suspension. Various other models and upgrades will be available.

Could the Birkin's time in the UK finally be here?

[www.birkinperformancecars.com](http://www.birkinperformancecars.com)

## DeHavilland opens its doors

If you're inspired by Jason Burrage's Running Reports on his DeHavilland DVT build, why not get along to the company's open day on 17 October? The Bury St Edmunds factory will be open for you to meet the team, see the cars and, who knows, even begin your own Ferrari Dino replica build. Address details and more can be found on the company's website. [www.dehavillandmotorcompany.co.uk](http://www.dehavillandmotorcompany.co.uk)



## Furore F1 sidepod restyle

Furore Cars, maker of the Formula One car apeing Toyota MR2 Mk1 based F1, continually develops the car. One of the recent changes – but not *that* recent, it's been available for about a year – is an optional redesign of the side pods. They give the car a much more modern look and, as well as being available for new kits, can be retro-fitted to existing cars. The photo below shows the old and the new next to each other, showing the effect of the restyle. [www.furorecars.co.uk](http://www.furorecars.co.uk)



## CKC hits Instagram

Complete Kit Car's social media activity knows almost no bounds. As well as being active on both Facebook and Twitter, we are now also on Instagram. If you're a fan of both kit cars and hashtags, you'll find us at [@ckcmagazine](#)







## Value for money

Whether a car represents value for money can be a subjective assessment. It's often a subject that creates heated debate regarding kit cars... how can a kit car which costs £x compare to a second-hand production sports car of the same value? But what sort of value do you put on a hobby? The whole period spent building a car, setting it up, using it and potentially meeting and joining up with like-minded people... all of those experiences have a value don't they?

But value for money was made startlingly apparent to me recently while reading a copy of *Evo* magazine. The new Lotus 3-Eleven has just been launched with an entry-level price of £82,000 and a race version at £115,200. Those both seem eye-wateringly expensive...

Compare that to the Ginetta G40 advert elsewhere in the issue. £29,995 gets you a road legal race car, two track days with expert tuition, ARDS race licence, four weekend race events and full mechanical factory support. All for less than £30k!

Now I realise the performance potential of the Ginetta compared to the Lotus is very different and I can hear all the other arguments that might be made to justify the Lotus being worth three times as much... but really?

Of course, what the Ginetta offers is a complete package, beyond the basic vehicle... a whole ownership experience. And that's exactly what's available when you build a kit car. The Ginetta just proves that, once again, the financial outlay is only part of the equation in working out if something is good or bad value for money.

**Ian Stent**

[ian@performancepublishing.co.uk](mailto:ian@performancepublishing.co.uk)

## Storm Warrior gets wider

Action Automotive has announced a revised version of its Land Rover Discovery based Storm Warrior 2 Thunderwagon. This one adds Le Monstre to the name and about 100mm to the overall width of the car.

The changes came about because the original prototype rubbed its tyres on the wheelarches on full

steering lock. Spacers were added to solve that, which consequently led to wider wheelarches to cover the protruding rubber. The new car runs on huge 22in diameter wheels (which are 12in wide). There will also be an aggressive new bonnet scoop for Le Monstre, not shown in the photo of the prototype below.

[www.carstunts.co.uk/stormwarrior](http://www.carstunts.co.uk/stormwarrior)



## From the ads: Quantum Xtreme



The Quantum Xtreme is one of those cars that's at risk of being slightly forgotten. Very little marketing from its last custodian MB Motorsport means that it didn't spend much time in the public eye, which is a pity because it had much to commend it.

The stainless steel monocoque chassis was a very stiff structure for the suspension to work upon, and John Sampson proved its worth with some very powerful hillclimb cars on slick tyres. As a road car, though, it rides and handles very well, and has a secure lockable boot and the option of solid sidescreens as part of its weather gear. It also had an unusual, thoroughly designed interior that was outside of the norm.

This one is advertised on Car and Classic. It has a Dutch registration and was completed in 2001. The vendor is asking £10,000 for the car.

## Regent Motor Company for sale

Francis Richards has been in touch to say that his company, the Regent Motor Company, is for sale. Moulds, jigs and rights to its range of wedding cars, together with the website, designs and stock, will all be included in the sale. The asking price is £65,000. Make contact on 01744 818516, 07831 800452 or [caremoret@btconnect.com](mailto:caremoret@btconnect.com) [www.regentmotorcompany.info](http://www.regentmotorcompany.info)



## Omex reveals throttle bodied 2.5 Duratec power figures



Omex Technology has released the dyno figures for the 2.5-litre Ford Duratec engine fitted with its own throttle bodies and camshafts (but with otherwise standard internals). It produces 210bhp from 6000 to 6500rpm but, more significantly, 200lb ft of torque with a very flat curve.

The set-up is ideal for cars with a differential ratio that's too high – so those with a Ford Sierra diff, we're looking at you! Prices for this throttle body kit are still to be confirmed.

[www.omextechnology.co.uk](http://www.omextechnology.co.uk)





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## Ultima online



While the spotlight is on Ultima following the launch of the new Evo, which is available in different power levels up to a frankly astonishing 1020bhp, the company has developed a new website.

The new site is reconfigured to be responsive to mobiles and tablets. It also features the new Ultima Sports logo, which incorporates a silhouette of the distinctive Ultima shape.

Aside from all that, there are some utterly stunning images of the Evo to flick through. That's reason enough for us to spend some time on the site...

[www.ultimasports.co.uk](http://www.ultimasports.co.uk)

## Hawk Daytona debut – in the metal

We mentioned Hawk's Daytona replica a couple of months ago, and now we've seen it – or at least its exquisitely made aluminium bodywork – in the flesh. Hawk was able to display it at the Silverstone Classic event last month, where it drew plenty of admiring glances.

Just as you would expect of a Hawk Cars product, the quality of the workmanship evident was sensational. The surface quality and general fit of the handmade panels is beyond reproach – the skill in their creation highly evident.

This is a very personal project for Gerry Hawkridge, who is keen to see the car racing, although naturally the car is available for those with pockets deep enough. It's not the sort of car that has a 'kit price' though, and it's likely that no more than one per year will ever be built. It's a very special car that will only be available in limited numbers.

[www.hawkcars.co.uk](http://www.hawkcars.co.uk)



## Semi-slicks: still legal

Toyo tyres has recently issued a release to clarify that semi-slick tyres, such as its own R888R (left), are road legal. Confusion stems from a change in legislation that sparked rumours that they will become illegal, compounded by a decision by the MSA to remove them from one of its lists of permitted tyres (a decision that has now been reversed).

Toyo UK's Alan Meaker said, "It is important for us to put some facts back into the marketplace. The Toyo Proxes R888 and R888R will retain

their E-marking, full road legality and MSA Blue Book eligibility. From our point of view, and thanks to the quality of our design, the new legislation hasn't changed a thing. It's important for consumers to check what they are buying though – as not all brands and products have been able to conform as we have. Certain other tyres, if produced after the 2014 cut-off date, may be illegal to use on the highway, or for club competition."

[www.toyo.co.uk](http://www.toyo.co.uk)

## LM update

Luso Motors has sent us one of its regular updates on the LM GT. These images show the car in its current form, making progress towards production.

The main body of the car is from a Smart Roadster, making the most of its production spec doors, interior and roof, but there's a new subframe up front to take a Honda S2000 engine under its new styling.

[www.lusomotors.com](http://www.lusomotors.com)



## 100 issues ago

Bugfest was our main cover line, but we couldn't fit all six beach buggies we'd gathered together on the cover. Elsewhere, we featured a striking looking Jaguar XJS based one-off built by Tapio Kihnä, who'd moved to the UK from Finland specifically because you can do that sort of thing here. The Exile, as the car was called, was a work-in-progress and we haven't seen it since, complete or otherwise.







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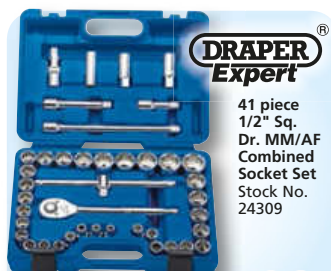
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# Magnificent Sevens

The Classic Sports Car Club's Gold Arts Magnificent Sevens Series is a great place to compete in your sevenesque kit. CSCC director, David Smitheram, gives an update on this year's series...

We were anticipating 2015 to be the year when forced induction cars may have taken victories at the front end, but so far every race has been won by normally aspirated cars. On the right track and in the right hands, supercharging may give a racer the edge, but difficulties with development, heat management, reliability and just being able to get the power down have so far proved a challenge.

With a total of nine classes there are categories for all types of Seven to compete and whilst Caterhams are the most numerous, there have been some close battles with racers in MK, Westfield, Procomp and Raw. At the time of writing, the series is about to compete at Rockingham for the first time since 2008, with two separate grids of Sevens competing. This event has attracted three French drivers in bike-engined MK Indys, making the

pic: www.davidstallardphotography.com



journey across the Channel just for this race.

Just three rounds will be remaining...

Sept 6 Donington Park (National)  
Sept 26 Oulton Park (International)  
Oct 31 Brands Hatch (Indy)

The season finishes with a day and night race at Brands Hatch over the Halloween weekend. Should be exciting, or should that be scary?

If CKC readers would like to contact the club, we will endeavour to offer complimentary

tickets and/or race programmes for the event of your choice. Seven racers are welcome to give us a try for the first time with a 'taster' round where there is no charge for registration.

[david@classicssportscarclub.co.uk](mailto:david@classicssportscarclub.co.uk)  
[www.classicssportscarclub.co.uk](http://www.classicssportscarclub.co.uk)

## Midas opens up

Midas Cars had its annual Open Day recently, right off the back of our mega seven-page feature on the marque in our July issue. As these pics from reader Paul Renton-Rose demonstrate, it looks like the day was a huge success, with a significant gathering to mark not just the Midas Owners' Club's 30th anniversary but also the 30th anniversary of the Midas Gold. [www.midasownersclub.co.uk](http://www.midasownersclub.co.uk)  
[www.midascars.co.uk](http://www.midascars.co.uk)



## Buggy show

More than two dozen beach buggies recently descended on the charming The Gate Hangs High pub and campsite in rural Hook Norton, near Banbury.

In addition to a good turn-out of the more popular buggies from GP and Doon, a smattering of rarely seen Beetle-based fun cars made the trip to deepest Oxfordshire too. These included a rare 1980s California from Warrington-based Limited Edition, plus examples of buggies built by Vulcan and CTR... a scarce rip-off of the 1970s



Manta Ray buggy.

A lengthy cruise in convoy of the local byways, plus the inevitable BBQs and booze back at base, ensured much merriment for all. The sun even shone; an essential ingredient for all buggysts!

[www.beachbuggybrummies.co.uk](http://www.beachbuggybrummies.co.uk)







## Zero wedding

No kit car cakes in CKC this month, but a kit car focused wedding is always good news. Tying the knot recently were Mark and Kate Henderson. It certainly helps when one of the ushers is Richard Hall of GBS, and perhaps therefore no surprise that three GBS Zeros were called into service to get the groom and his ushers to the church in Newark, complete with traditional white ribbons. Meanwhile Kate arrived in a somewhat more suitable Beauford, before everyone then descended on Stoke Rochford Hall in Lincolnshire for the reception.



## AutoSolo and more with ECMC

If you want to do more than just drive on public roads, there are myriad different clubs offering an introduction and involvement in all sorts of different competitive disciplines.

The Eastern Counties Motor Club has a long heritage dating back to the 1950s and has always been involved in organising competitive events for its members. One of those



is involvement in the AMSC (Anglian Motor Sport Club) AutoSolo where two of its members, Caterham owner Geoff Hodge and Westfield owner Nick Skuse, have been having great fun in amongst other more mainstream machinery (pictures courtesy of Caroline Cruz, ECMC).

Why not see what your local club (kit focused or otherwise) can offer you?

[www.ecmc.co.uk](http://www.ecmc.co.uk)

[www.aemc.org.uk](http://www.aemc.org.uk)

## In brief

Five members of the Dorset Westfield Sports Car Club headed over to the Isle Of Man recently, which included a visit to the brand new motor museum there. According to the club, it's well worth a visit, should your own club consider a similar jaunt.

[www.wsccl.co.uk](http://www.wsccl.co.uk)

[www.facebook.com/isleofmanmotormuseum](http://www.facebook.com/isleofmanmotormuseum)



Come and join CKC at the Restoration Show being held at the Bath and West Showground over the weekend of 7/8 November. After consultation with the organiser, we've been allocated a generous size exhibition hall, exclusively for the use of kit car clubs. Register your interest by contacting us using the details here, and for more in-depth information check out our event preview on page 15.

[ian@performancepublishing.co.uk](mailto:ian@performancepublishing.co.uk)

[www.carsandevents.com](http://www.carsandevents.com)



If you are looking for a club to join, then the chances are you'll find it listed within the club page of the CKC website. We've a vast amount of information and useful links on the site, as well as the CKC shop packed full of kit car material to buy.

If you are already part of a club, or are a club secretary, then we'd also really appreciate you taking a quick look at the club page to check that your club's contact details are correct. Club contacts have a habit of changing and we're not always told when that happens. If it needs changing (or your club isn't listed) then please contact us and we'll update the page accordingly.

[ian@performancepublishing.co.uk](mailto:ian@performancepublishing.co.uk)





# 2015 Events

There's plenty to entertain you and your kit car for the remainder of 2015. Here's our diary of the events that have caught our eye. If you know more, tell us and we'll get the word out.



## AUGUST

### Sunday 23rd

#### Cobra Drivers' Club at Rest And Be Thankful

Classic Car Tours

T: 01355 260422

W: [www.classic-car-tours.com](http://www.classic-car-tours.com)

From £78 per entrant.

### Sunday 23rd

#### Thornfalcon Classic Car Meet

Henlade, Taunton, Somerset

Satnav: TA3 5NB

E: [info@thornfalconclassics.com](mailto:info@thornfalconclassics.com)

W: [www.thornfalconclassics.com](http://www.thornfalconclassics.com)

### Sunday 30th

#### Mini Marcos Euregio Meeting

Leusden, Netherlands

E: [euregiomeeting@gmail.com](mailto:euregiomeeting@gmail.com)

## SEPTEMBER

### Sunday 6th

#### Shere Hillclimb

Shere, Surrey

Satnav: GU4 7RL

W: [www.sherehillclimb.co.uk](http://www.sherehillclimb.co.uk)

Third year for this popular event. Come and watch or book a place on the hill.

### Friday 11th-13th

#### Goodwood Revival

Goodwood Race Circuit, West Sussex

Satnav: PO18 0PX

T: 01243 755055

W: [www.goodwood.co.uk](http://www.goodwood.co.uk)

World class historic motorsport.

### Sunday 13th-17th

#### Geneva-Barcelona Challenge

T: 01386 45556

W: [www.guildofmotorendurance.co.uk](http://www.guildofmotorendurance.co.uk)

### 26th-27th

#### Sywell Classic: Pistons And Props

Sywell Aerodrome, Northamptonshire.

Satnav: NN6 0BN

T: 01775 768661

W: [www.sywellclassic.co.uk](http://www.sywellclassic.co.uk)

An increasingly popular event.

## OCTOBER

### Sunday 4th

#### Goodwood Breakfast Club: Vee-Power Sunday

Goodwood Motor Circuit, West Sussex

Satnav: PO18 0PX

T: 01243 755060

E: [cooked@goodwood.com](mailto:cooked@goodwood.com)

## NOVEMBER

### Sunday 1st

#### Goodwood Breakfast Club: Bahn-Stormer Sunday

Goodwood Motor Circuit, West Sussex

Satnav: PO18 0PX

T: 01243 755060

E: [cooked@goodwood.com](mailto:cooked@goodwood.com)

### 7th/8th

#### The Footman James Bristol Classic Vehicle Restoration Show

Bath & West Showground, Somerset.

Satnav: BA4 6QN

T: 01507 529529

W: [www.carsandevents.com](http://www.carsandevents.com)

Established classic car event now with dedicated hall for kit car clubs. Contact CKC directly to register your interest. Limited indoor space.

### Saturday 21st

#### totalkitcar LIVE

Brands Hatch, Kent

T: 01883 372 085

E: [stevetotalkitcar@yahoo.co.uk](mailto:stevetotalkitcar@yahoo.co.uk)

W: [www.totalkitcar.com](http://www.totalkitcar.com)

Satnav: DA3 8NG

**DO YOU HAVE AN EVENT YOU WANT TO PROMOTE?**

Contact us at  
[ian@performancepublishing.co.uk](mailto:ian@performancepublishing.co.uk)  
and we'll put relevant dates into Events Diary.





# Kits & Classics

A dedicated hall has been set aside for kit car clubs at the Bristol Restoration Show over the weekend of 7/8 November. Here's how you and your club can join us.

**A**lthough we are not suggesting the Bristol Classic Restoration Show (November 7/8) is a replacement for the old Exeter Kit Car Show, after various meetings with the organiser, we have now arranged for a hall to be set aside exclusively for kit car clubs. Held at the Bath and West Showground in November, it is an opportunity for clubs and private enthusiasts to come together for a new West Country based event towards the end of the year. So what can you expect?

## THE SHOW

The Classic Restoration Show is one of three established events organised by Bristol Classic Car Shows. As the name suggests, the focus is on components and tool suppliers... so this is a chance to stock up on all the bits and bobs you'll need to ensure your kit car

building, restoring and servicing can be achieved over the winter months. There will be hundreds and hundreds of different stall holders, selling everything from tools, lights, rubber seals and just about anything you can think of!

There is, of course, more to it than just parts. The show area includes a number of exhibition halls, and those not occupied by the trade are jam-packed with classic car clubs, cars sales and even a classic car auction!

Outside space is available for private individuals to bring their cars and be a part of the event (there is no discount for this, beyond taking advantage of the advance ticket discount). And despite the time of the year, this should prove to be a fascinating place to see all manner of different privately owned classic and kit cars.

## KIT CAR CLUBS

CKC has organised for one of the halls to be set aside exclusively for kit car clubs. Space will be allocated on a first come, first served basis and we advise early booking to ensure your members can be guaranteed space under cover. Numbers of cars will be limited and need to be guaranteed for both days (different cars can fill the space each day) to ensure



CKC has booked a hall just like this, exclusively for kit car clubs.

we don't have any empty spaces. Cars on these inside club stands will gain free entry to the event for the car and driver.

This is an opportunity for the kit car clubs (and the wider scene) to further integrate itself into the classic car arena... so we need to put on a good show!

To discuss your requirements and register your club's interest, please contact Ian Stent using the contact details below.

## CLUB CKC MEMBERS

CKC subscribers, under the Club CKC banner, have the chance to join us within the hall if you are not already part of a club which has booked stand space. Please



Citroën Specials' Club at the venue earlier this year.

contact CKC to book your space and free entry.

## A GREAT DAY OUT

This is not a traditional kit car show and we are not expecting kit car manufacturers to attend (although they'd be very welcome). Above all we'd like you and your club to have an enjoyable and fun day. This is a perfect opportunity for you to get together with fellow club members before the winter sets in and to pick up any vital parts or tools at discounted show prices. Who knows, you may even bag a bargain car in the auction! ■



Expect a good display of cars outside.



Show will be jam-packed with stall holders selling everything you could possibly need for your car.

## Show details

**The date:** November 7/8, 9.30am-4pm both days.

**The venue:** Bath and West Showground, Shepton Mallet, Somerset BA4 6QN.

**Ticket prices:** Adults – £8 in advance, £10 on the day. Under 16s free. Kit car drivers booked as part of an inside club display gain free entry for the driver.

## BOOKING INFORMATION...

For advance public tickets contact Bristol Classic Car Shows directly.

W: [www.carsandevents.com](http://www.carsandevents.com)

For inside club stands: Contact Ian Stent at Complete Kit Car. T: 01823 617908.

E: [ian@performancepublishing.co.uk](mailto:ian@performancepublishing.co.uk)



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# Gary Axon

"With a few exceptions (no names!), the overall standard of kit car marketing is improving, as it urgently needs to, but let's hope that having a presence at future kit car shows such as Stoneleigh, becomes part of this promotional mix. If not, I fear through false economy that we might be seeing a depleted number of manufacturers surviving the challenges of the future"



In 1982 Gary Axon penned his first published words for *Alternative Cars* magazine, precipitating what has become a lifelong obsession with the more obscure elements within the automotive world. Today he's a leading light in helping to assemble the shortlist of invited cars at motoring events, such as the Goodwood Festival of Speed, Revival and the Concours of Elegance.

Being woken by the sound of rain battering against the window is rarely a good start to the day. When that day is the first day of the Stoneleigh show, heavy rain is especially unwelcome. Sure enough, driving the 80 miles or so to Stoneleigh that wet Sunday morning, I only saw four kit cars braving the elements *en route* to the event, whereas ordinarily I'd pass dozens. It didn't bode too well for this annual 'must attend' event.

Upon arrival at Stoneleigh though, rather than seeing damp tumbleweed blowing through, I was pleasantly surprised to see that plenty of kits had defied the weather, with the venue looking quite full. You kit car owners are clearly a hardy bunch!

Feeling reinvigorated by the vast array of interesting cars and well-supported club stands outside, I ventured into the main halls, where alas my heart sank again. A few empty stands and a number of kit car manufacturers notable by their absence is not what the British kit car industry needs at the moment.

With a couple of exceptions, what was on display at Stoneleigh was great, with the event really acting as the perfect showcase for the quality and imagination of today's kit car industry. However, with Stoneleigh now being the UK's only major kit car exhibition, it was disappointing to me not to see more specialist vehicle exhibitors proudly displaying their products to a keen and knowledgeable audience. After all, where else are manufacturers going to be able to reach such a large and understanding crowd of potential customers otherwise?

In this multi-media age, some manufacturers might argue that the need to attend a static exhibition has long since passed, and that investment in a strong digital platform is more important. That may be so, but without creating the initial brand

awareness and post-event publicity that exhibitions bring, how are consumers going to know about these products, even with a state-of-the-art website and good YouTube presence?

As esteemed editor Wilkins recently reported in this journal, SDR Sportscars and its capable Impreza-based V-Storm failed as the company belatedly recognised that it had focused too much of its limited time and money on perfecting the car, at the expense of little or no investment in marketing, which ultimately and undeservedly killed off the entire project. A sad tale indeed, but tragically one that is all too common.

As a freelance communications consultant, I have spent over two decades promoting premium car brands and the world's most prestigious motoring events, and have picked up a trick or twelve along the way on the importance of creating customer awareness and desire through effective marketing and PR, plus crucially a strong visual presence at events.

Reaching out to where those all-too-elusive customers can actually see, touch and smell the product – and possibly even drive it – still has no equal in the field of digital marketing, especially when the enthusiasm and pride in a kit car maker's product becomes so infectious to the consumer.

With a few exceptions (no names!), the overall standard of kit car marketing is improving, as it urgently needs to, but let's hope that having a presence at future kit car shows such as Stoneleigh becomes part of this promotional mix. If not, I fear through false economy that we might be seeing a depleted number of manufacturers surviving the challenges of the future, with less kit car enthusiasts visiting these shows as they offer less to see. I sincerely hope I'm wrong, but ultimately it will be down to the industry to decide and show its support, come rain or shine.

## NEXT MONTH



Respected classic car journalist Richard Heseltine has been a major player at *Classic & Sports Car* and *Motor Sport* magazine before becoming a sought after freelance journalist. But he also happens to be one of the most knowledgeable kit car boffins you'll ever come across.





The

## REPLICA

that's not

Ferrari never made a convertible version of the 250 SWB – but that hasn't stopped Nubodi Automotive building a soft-top Kalifornia. Does it stack up anyway?

Words and pictures: Adam Wilkins

**W**hen is a replica not a replica? The source of inspiration for Nubodi Automotive's new 250 SWB Kalifornia is immediately apparent; if the name doesn't give it away, then the neat front-end styling is a clear indication that this car takes its styling cues from Ferrari 250 SWB. But there's no way it can be a replica because Ferrari never built an open-top SWB.

So how did a 'replica' of a classic car that never actually existed come to be? Tribute Automotive, for which Nubodi acts as an agent, revealed its 250 SWB coupé replica last year. "I told Chris [Welch, Tribute Automotive] that I'd prefer a convertible and kept nagging him to do it," says Richard Bird of Nubodi. He figured that taking the convertible BMW Z3 base and putting a permanent roof on it seemed the wrong way of doing things. "I said you've done most of the work, all you need to do is make a mould for the back." As well as the inherent benefits of a convertible, it also makes the job of converting the Z3 easier, but we'll come to that later.

While the car you see here performs an official role as a demonstrator, it's also Richard's personal car. This is the first one on the road, and appeared at Stoneleigh in a rather rough and ready form. From the show, it was delivered straight to Nubodi's workshop near Reading in Berkshire where it was built up to the standard you see here.

As well as being insistent on a soft-top, Richard also prefers automatic gearboxes so he paid a premium for a self-shifting donor. It has an M-sport suspension and the 3.0-litre straight-six, which is as high spec as a Z3 gets without going as far as the Z3M, which are valued at a significant premium. In standard form, it produces 231bhp but, with the demo's remap and freer-flowing exhaust, it's probably something closer to 260bhp. By comparison, it's interesting to note that the original Ferrari's 3.0-litre V12 makes around 230bhp.

But drawing comparisons between a car that was only available as a coupé with a convertible replica seems a little futile. Instead, I see the Kalifornia as its own car and, viewed on that basis, it's simply a rather attractive roadster in its own right. I've always preferred the looks of the 250 SWB over the more storied (and even more valuable) GTO, and this homage captures the car's face pretty well.











There's plenty of good period detailing, too, without adhering to authenticity to a great extent.

For instance, the Monza fuel filler cap is much smaller than the Ferrari's, and on the wrong side. For its forthcoming coupé demonstrator, Nubodi will go to the effort of moving the filler cap to the correct side and fitting it with an Aston filler cap. But the convertible roof has given this car freedom from close replication.



That's not to say that Nubodi hasn't gone to town on detailing – there are no exterior visual giveaways to the base car's 2002 origins. P700 headlights and Lucas spotlights may not have been fitted to the originals, but they're of the right era. Same goes for the Lucas tail lights, and the door handles and boot handle which all come from a classic Mini. If a 1960s look is available on a budget, it has gone on the car. To that end, the grille came from B&Q, while the grille surround is GRP that has been scratched before painting to make it look like polished aluminium. Neat. Those wire wheels were sourced affordably, too, from a Jaguar XJ with no need for spacers or lowering.

Richard has plans to overhaul the interior during the winter with a more period appearance, but for now it makes do with a Moto Lita steering wheel, a



Ferrari replica or not, the 250 SWB Kalifornia is a pretty roadster in its own right. Build one at home from around £8000. Turnkey from £17,995.



## LOOK

All the period detailing is added with affordability in mind – that grille is made from materials from B&Q.





## Tech spec

**Engine as tested:** 3.0-litre BMW Z3 straight-six.

**Engine options:** Any four or six-cylinder Z3 engine.

**Chassis:** Standard BMW Z3 monocoque structure.

**Bodywork:** One-piece GRP flip front with removeable bonnet, one-piece rear end, hood lid, door skins, sills.

**Suspension:** Unmodified BMW Z3.

**Steering:** Unmodified BMW Z3.

**Brakes:** Unmodified BMW Z3 discs all-round.

**Kit price:** £2950 (no VAT).

**Budget build cost:** From £8000.

**Contact:** Nubodi Automotive, Reading, Berkshire. T: 07779 365247.  
E: nubodi.autos@gmail.com  
W: www.nubodi.moonfruit.com



Richard Bird runs Nubodi Automotive. He's been building cars for 35 years.



Engine either accessed through small removeable bonnet or flip front.



dashboard-mounted chrome mirror and, most significantly, Rover 75 seats. Those are an inspired choice; they're available in a range of different colours, trimmed with good quality leather and very comfortable. They look the part, too, particularly with the headrests removed or, like the demo, fitted with the headrests from the back seat of a 75. Richard relocated the plastic panel that houses the buttons, but wired it in to the BMW so that the electrical adjustment remains. They're heated too. The best bit is the price: he sold the Z3 seats for £300 and has recently bought another pair of immaculate Rover seats for a barely believable £37.50.

For now, the cabin ambience is more Z3 than exotic classic, but it was certainly up to scratch for our first drive

of the prototype. And here's the best bit of a body conversion such as this: the styling is at odds – in a good way – with the nature of the car. We have a six CD changer, powered hood, central locking, fuel economy readout (which showed a highly respectable 31mpg after our drive) and all the other stuff that you're used to with modern cars. Even after all the interior mods that Richard plans, the equipment will remain – it'll merely be hidden out of sight.

Of course, being a Z3 it's a cinch to drive. Power steering, lightly weighted pedals and easy ergonomics make it a car you can get in and drive without any of the foibles you'd expect of a genuine classic. The unmodified suspension is well controlled, the 3.0-litre six-pot gives





decent urge (if slightly hobbled by the automatic gearbox in this car) and it makes a decent noise when you press on. At a cruise, it's rather more muted. Just as we discovered with our own Bertini GT25, which is also a converted Z3, it's a car you could easily live with every day.

The Z3 never had a reputation for being the last word in sharp handling in the way a Mk1 Mazda MX-5 was, but the significant power upgrade and the option of more than four cylinders makes the German car a better choice for this kind of conversion. The looks suggest something more than the 130bhp four-cylinder that the MX-5 can offer.

And it's actually rather good fun in the corners. The tall sidewalls of the tyres give it a relaxed attitude and a bit of movement in the rubber when cornering that suits the 1960s appearance. The thin-rimmed Moto Lita steering wheel adds to the classic feel, transmitting the slight vibration that may stem from the fitment of the Jaguar wheels. Yes, it's fun

to drive – and would be better still with a manual gearbox.

As with any body conversion, the simplicity of the build is one of the key areas of its appeal – and the open top Kalifornia is easier to assemble than the coupé. It has fewer interior panels, no need to source the rear glass (MGB) and is easier to trim. A one-piece front end replaces the BMW panels, with an opening panel that allows access for oil changes and other servicing jobs. There's another one-piece panel at the back, and the boot lid uses the original BMW catch in league with the classic Mini handle. Production versions will have exterior hinges in place of the prototype's internal items, which proved rather fiddly to fit.

Replacement sills and new door skins complete the look, and almost entirely erradicate any Z3 cues from the exterior. The only remaining giveaway is the windscreen and quarterlights, although the aluminium trim of this car does a surprisingly good job of making the

whole arrangement look less modern. You might even notice in the photos that the black paint has been removed from the windscreen wiper arms, the remaining bare metal having been polished.

The £2950 (no VAT) kit includes all the body panels and the grille surround, leaving builders to source a donor, paint and various ancillaries such as lights, brightwork and badges. Self-builds, therefore, can range from £8000 for a basic spec to £15,000 for what Nubodi describes as a 'show car'. Turnkey cars start from £17,995.

If I were to build a Kalifornia, I'd do away with the Ferrari badges and enjoy it for what it is in its own right – a modern sports car with the more charismatic styling of an older one. With its convertible roof, no Ferrari fan is going to be fooled and, with that in mind, it has enough inherent appeal of its own without needing to 'borrow' an image from elsewhere. ■







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Words and pictures: Ian Stent

# Festival Of Speed: Better than ever?

It's difficult to say anything about the Goodwood Festival Of Speed that hasn't already been said. We've been to a few other mainstream events this year and one thing this year's Goodwood established perhaps more strikingly than ever is... there are no other events in the UK that come close. And this also puts what might appear to be a costly entry (£63 for a Saturday ticket) into focus. By comparison to some other almost as expensive events, Goodwood is a bargain!

If there's a downside, then we've come to the conclusion that, despite having been to the event for years, it still takes us more than a day to really enjoy all

that is on offer. However you do it, one day simply isn't enough.

So what would be our recommendation if you were to decide that 2016 was the year to go... Go on Saturday and Sunday (to ensure you see the fastest timed runs up the hill and also witness the celebrities etc), walk around the show on Saturday, making sure to take in the supercar display and the rally section at the top of the hill. And then on Sunday relax in a prime location grandstand near Molecomb corner and enjoy. Alternatively, don't forget the Goodwood Revival Meeting later this year... 11-13 September. ■

[www.goodwood.com/grr](http://www.goodwood.com/grr)



Pic: Jeremy Smith

1976 March 2-4-0.



We'd not seen the SCG 003S before...



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Stirling Moss and Nico Rosberg chat.



Ant Anstead with his Evanta.



Ken Block makes a statement in his 1965 Ford Mustang Hoonicorn.







Words and pictures: Adam Wilkins (main image: Silverstone Classic)

## Silverstone silver anniversary

**Y**our experience of the Silverstone Classic in its 25th year would have been very different depending on what day you were there. The Friday, when qualifying takes place, saw non-stop rain and lots of yellow flag sessions on track. Saturday's weather was better, which no doubt helped the crowd size for the evening's Status Quo gig, and then the rain returned with a vengeance for Sunday.

Despite that, the fact that all tickets are pre-booked meant that the event was still busy and a huge number of owners' clubs were well supported all weekend. A number of kit car clubs make

the Silverstone Classic a regular event on their calendars, and we witnessed large numbers of GT40 replicas, Stratos replicas, GTMs, Cobra replicas and Ultimas around the venue despite the inclement conditions. Nobody ever said you can only use a kit car when it's sunny. The fact that the clubs are actually within the circuit's infield gives the event a nicely inclusive feel.

The racing itself was hugely entertaining. My particular favourites were the 1960s GT cars and saloon cars of the same era, but there was something for everyone – from a 1914 Sunbeam to a 1998 McLaren F1 GTR.

[www.silverstoneclassic.com](http://www.silverstoneclassic.com)



Lovely Ogle racer.



Turner racer in the pits...



...and road car in the club area.



Fairthorpe another early special on show.







# Kits and customs in Kent



Words and pictures:  
Adam Wilkins

It's very important, when attending a one-day show, to check the date of the event, something your trusty correspondent failed to do and arrived at Aylesford Priory for Kent's Kit, Custom and American car show a whole day before anybody else. Better than being a day late and missing the whole thing, I suppose.

Fortunately the pessimistic forecast for the Sunday proved wrong and, while some hardy souls got a soaking *en route*, it remained dry, sunny and warm all day. That's important for an outdoor show, and by all accounts it managed to attract considerably more cars than it did last year.

Even so, it's quite a small show, almost filling one small field within the grounds of the priory. But

with a modest £3 charge to get in, you can't really complain – treat it as a leisurely summer's day out and it'll meet your expectations.

Some trade stalls lined the outer edge of the showground, while the mix of cars lived up to the kit, custom and American billing. Thanks to the Kent Kit Car Club, kit cars were deserving of the billing at the front of the list: they won the prize for biggest club attendance, with a typically mixed variety of cars. The club reaches its 25th anniversary this year and is as strong as ever.

The added attraction of the priory and a farmers' market made this a worthwhile day out if you're close by, and one that has grown in its first two years. It's even better on the correct day...

[www.kentskitandcustomcarshow.co.uk](http://www.kentskitandcustomcarshow.co.uk)



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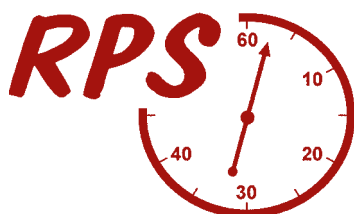
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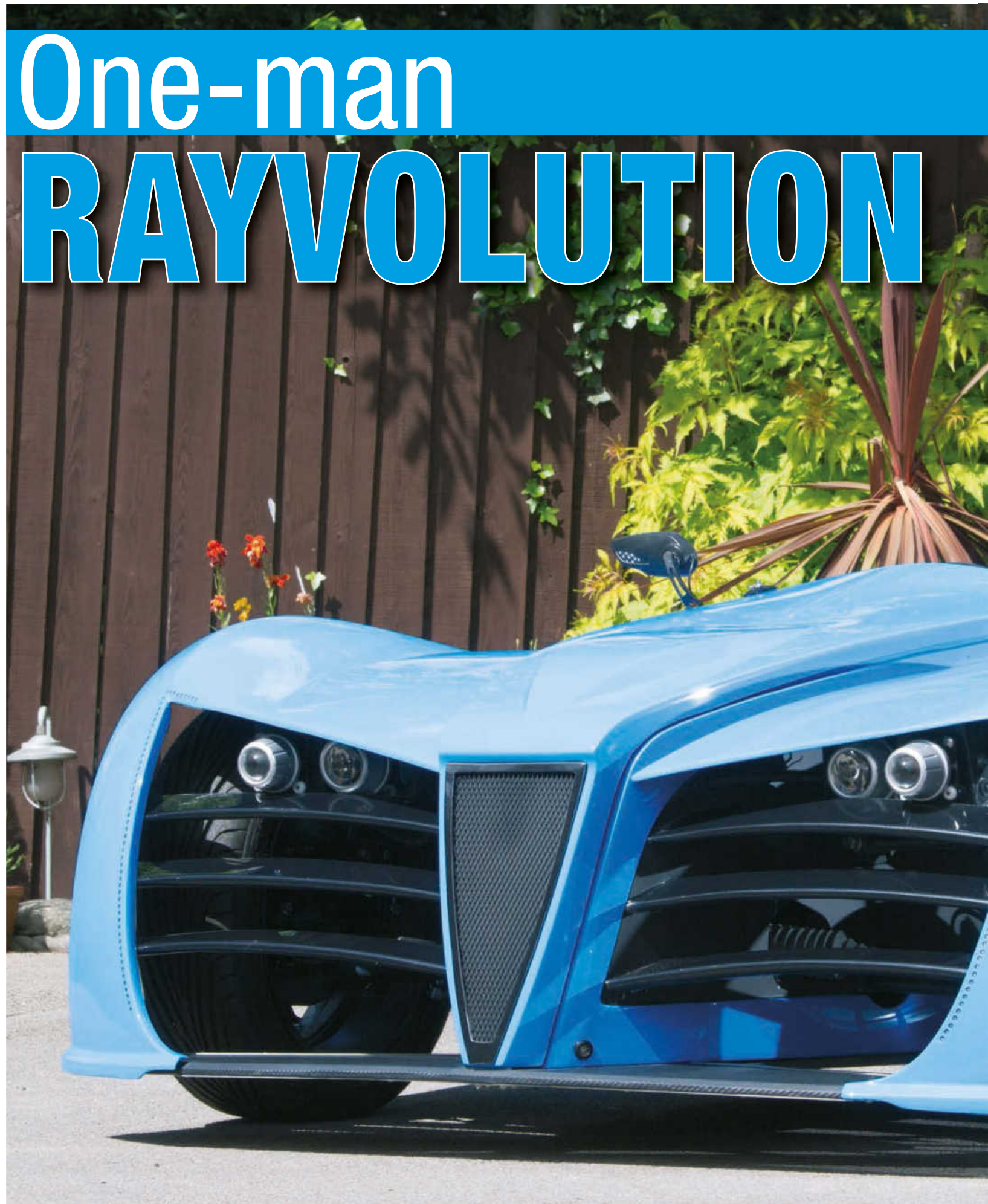
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# One-man RAYVOLUTION



When the French designed Rayvolution Evo was launched in 2007, lots of us thought it looked spectacular. CKC meets the one UK enthusiast who took it further... and ordered one!

**Words and pictures:** Ian Stent

It's one thing to design, build and launch a new product in your home market, where you understand your customer base and the regulatory challenges you must overcome, but it's quite another to do it for a foreign country. That's what French designer, Tony Lafaye, set out to do when he first sketched out what would become the Rayvolution Evo reverse trike (two wheels at the front, one at the back). The chances of selling such a creation in his notoriously strict home country were slight (certainly for road use) so Tony perhaps naturally looked across the Channel for a potential outlet.

The crew here at CKC immediately fell for his product. Visually startling, the Rayvolution had one stand out quality... professional styling. Tony studied vehicle design while in Paris and the Rayvolution could be nothing other than created by someone with a visual eye. Over the next few years the car made a number of UK show appearances, perhaps most dramatically on the CKC stand at the Goodwood Festival Of Speed in 2010... it was the star of the display and attracted huge attention and endless positive comments.

But after all the hard work, sales were not forthcoming. Whether it was the company's location in France and a natural apprehension by UK customers to deal with a company in a different country







Above: AP Racing brakes give premium stopping power. Above right: Wing mirrors have integrated indicators. Below left: Original Suzuki instrument panel retained. Below right: Horizontally located front coil-over dampers.



### I own this

**Name:** Morgan Hughes

**First car:** Astramax van

**Fastest car you've been in:**  
Holden V8 supercar

**Favourite thing about your car:** The whole front end



and potentially in a foreign language, or perhaps the trike's single-seater configuration, but the Rayvolution simply failed to deliver the rewards we felt its designer richly deserved... with the exception of one UK enthusiast!

Morgan Hughes came to the Rayvolution perhaps from a different direction to most... first and foremost, he was a bike enthusiast. Along with sister Natalie, Morgan runs Joe Hughes International, a company founded by his father and dedicated to the speedway competition scene around the world. Previously a speedway racer and lifelong bike enthusiast, he's also been a fan of alternative cars... the very first Vauxhall Maloo officially imported to the UK is currently on the driveway when we visit.

It was this interest in vehicles with more than two-wheels that led him to pick up a kit car magazine and spot the Rayvolution. "I fell in love with the shape and design," he remembers. Next move was a visit to that year's Stoneleigh kit car show, to see the car in the flesh. Having never been to such an event before, his eyes were opened to the variety of machinery on offer, but there was still only one vehicle in his sights. Unlike some replicas of exotic supercars which feature mundane underpinnings, he was even more taken by the honesty of the Rayvolution. "You could see what it was all about," he enthuses. With its





## LOOK

TaylorMade Racing manufactures cunningly concealed silencer in place of bike's standard exposed can. It sounds fantastic.

comprehensive use of the bike bolted to the back of a single seat spaceframe structure, there were no secrets with this car. The only surprise was that Morgan had never previously been a fan of three-wheelers!

In reality, his previous experience of the genre had largely been reserved to conventional trikes, perhaps with a VW Beetle engine out back and a single front wheel... the reverse trike phenomenon had passed him by.

Morgan saw the car at a number of UK events and was in email contact with Tony Lafaye to get all the details he needed. The location in France never really bothered him, and he was always impressed by Tony's obvious passion for his creation.

Being a single-seater, Morgan hadn't even driven or been in the demonstrator before finally placing an order in 2010 for a comprehensive kit package from Tony. In addition to the chassis/suspension and painted body panels, this included the wheels, fibreglass seat and items such as the steering rack and column.

Having placed the order, he now turned his attention to sourcing the bike. Once the front forks and fairings are removed, the complete bike is effectively bolted into the back of the Rayvolution chassis. Tony's demonstrator used an older 750cc Suzuki unit, but via his contacts in the trade, Morgan found something rather more exciting. A brand new Suzuki GSXR

1000 K9 would have cost around £10,000 from the showroom, but Morgan sourced one with just a few hundred miles on the clock which had been involved in a minor accident that had wiped out the front forks and inevitably damaged the fairing... none of which he needed. For just over £5K he had a virtually brand new 180bhp bike.

Although the original plan had been for Morgan to build the trike himself, time constraints and other unforeseen events meant when it came to the spannering, he needed to call in another work contact, in the form of AA Alignments in Derby, where Thomas and Jas were charged with the task of assembling the Rayvolution, with Morgan popping in to help whenever the opportunity arose.

But before the build could begin, there was a hold up in the manufacturing process. Tony could make the body panels (and sprayed them the Lamborghini inspired solid blue that Morgan had requested), but he was struggling to get a French fabricator to create the chassis. Calling in another favour, this time from his exhaust manufacturer, Morgan arranged for Tony to deliver the chassis jigs over to the UK, for Morgan's supplier to create a chassis.

With the comprehensive use of the bike at the back of the car, a simple single-seat centre section and largely conventional

double wishbone front suspension (with inboard coil-over dampers), the Rayvolution should be a relatively simple construction... and that's how it proved,

even for this very first kit. Even the 5-piece pre-painted bodywork went together easily, albeit with great care to avoid any surface damage.

Inevitably, there have been some modifications. Morgan wasn't keen on the open front end, with the suspension largely visible from the front. Conventional grille material just didn't look right, so Morgan next sourced some sheets of vacuum formed plastic which could be cut to shape and gently heated to give the required curve. With a carbon effect surface finish, the result was perfect. The daylight running light LED strips on the outer edge of each front wing are also a great touch. With each wing drilled to accept the 57 LEDs, clear vinyl was located over the front to stop road grime getting into the crevices. When switched on, the effect is fantastic.

Out back, Morgan didn't like the conventional bike silencer, which was a very visual reference to the Rayvolution's bike origins. In its place he's located a TaylorMade Racing silencer which

## Tech spec

**Engine:** Suzuki GSXR 1000 K9 4-cylinder bike engine, 180bhp.

**Gearbox:** Suzuki 6-speed sequential.

**Suspension:** Front – Double wishbones with pushrod operation to inboard horizontally located coil-over Protech dampers. Rear – Suzuki bike suspension, unmodified.

**Brakes:** Discs all-round, AP Racing front calipers, Suzuki rear caliper.

**Interior:** Rayvolution seat trimmed in Alcantara, Suzuki instrument pod, Suzuki gear lever relocated to beside driver, Sabelt harness.

**Exterior:** Solid blue paint, carbon detailing, Wolftrace front wheels, Carbon Mods rear wheelarch, LED rear light units.



sits under the swing arm and is largely concealed behind a carbon shield.

In little more than a year of working in odd spare moments, Thomas and Jas had assembled the Rayvolution to a stage where Morgan needed to book an MSVA test (the test required for three-wheelers, in place of IVA for conventional 4-wheeler cars).

Although it failed on a small number of very minor items (including having too many front indicators!) it was quickly back for a retest and resulting pass. Registration was next and the DVLA allocated the car a brand new registration, presumably because the donor bike was barely out of the showroom!

The one and only Rayvolution Evo was officially on the road! Frustratingly, using the Rayvolution properly has proved as elusive as Morgan's wish to build the car himself. It's been on the road a few times and has now been set-up. The ride is apparently firm, but the trike drives well and sounds utterly spectacular through the new exhaust system. With a redline

at 16,000rpm and 180bhp available in a machine that weighs just 388kg (which equates to 463bhp per tonne), one can only imagine at the performance. It's certainly not going to be slow! Morgan had hoped to do a few track days with it, but that too has so far evaded him.

All of which now means he's decided the Rayvolution must go to someone who can really make use of it. To reflect the cost of having the car built professionally, he's asking a top price but one that's easily quantified by the cost of parts and labour. If you wish to see it for yourself, it's currently in the showroom of Junction 17 Cars in Nottingham.

Seeing this car for the first time, it reminds us of just how spectacular the original design remains. There is simply nothing else like it. And it's not just the styling... The single-seat configuration may have ultimately helped to limit the car's sales potential, but it endows the Rayvolution Evo with a compactness and focus that couldn't be achieved with a more conventional two-seat layout. The striking colour combination on Morgan's example is inspired and the quality of the finish is hard to fault. Ultimately, the front chassis needs painting as it's currently bare, but otherwise this machine is good to go.

Unsurprisingly, Tony Lafaye closed Rayvolution as a business some time ago, but he's still around and still passionate about his creation. Twist his arm hard

## Useful contacts

**Kit:** Tony Lafaye. E: [lafaye\\_tony@yahoo.fr](mailto:lafaye_tony@yahoo.fr)

**Build work:** AA Alignments, Derby, Derbyshire. T: 01332 764900.

**Rear wheelarch:** Carbon Mods, Stoke-on-Trent, Staffordshire. T: 01782 324000. E: [sales@carbonmods.co.uk](mailto:sales@carbonmods.co.uk) W: [www.carbonmods.co.uk](http://www.carbonmods.co.uk)

**Seat trim:** David Beswick Coach Trimming, Derby, Derbyshire. T: 01332 292122.

**Exhaust:** Tailormade Racing, Mansfield, Nottinghamshire. T: 01623 627600. W: [www.tailormade-exhausts.co.uk](http://www.tailormade-exhausts.co.uk)

**It's for sale:** Contact Morgan Hughes. E: [morgmaloo@icloud.com](mailto:morgmaloo@icloud.com) W: [www.junction17cars.co.uk](http://www.junction17cars.co.uk)

enough and he may even be able to make a kit for you. You'll find his details in the panel above.

In the meantime, if you fancy owning an exceptionally rare (unique in the UK) car with supercar performance potential, contact Morgan to find out more. He can be found via email on [morgmaloo@icloud.com](mailto:morgmaloo@icloud.com) ■









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- Multi-position charge regulator
- Overload protection on charging cycle

MODEL	MAX AMPS CHARGE/BOOST	EX VAT	INC VAT
BC100N	15/100	£47.99	£57.99
BC130C	15/120	£61.99	£74.39
BC190	38/180	£89.98	£107.98
BC210C	15/120	£94.99	£113.99
BC410E	35/400	£129.98	£155.98
BC520N	50/510	£189.98	£227.98

**Clarke PRO 7" SANDER/ POLISHER**

CP185

FROM ONLY **£69.98** EX VAT  
**£83.98** INC VAT

- Pro sander polisher, includes hook & loop backing pad and hook & loop wool polishing bonnet.
- 1200w motor

**Clarke X-PRO AIR CAT131**

FROM ONLY **£19.98** EX VAT  
**£23.98** INC VAT

• Huge choice in-store/online

MODEL	DESCRIPTION	EXC. VAT	INC. VAT
CAT127	3" Cut off tool	£22.99	£27.99
CAT128	1/4" Die Grinder	£19.98	£23.98
CAT131	1/2" Impact Wrench	£59.98	£71.98
CAT132	13pc 1/2" Impact Wrench Kit	£74.99	£89.99
CAT133	3" Cut Off Tool & 1/4" Die Grinder	£47.99	£57.99
CAT134	1/2" Reversible Ratchet	£34.99	£41.99
CAT136	6" Dual Action Sander	£34.99	£41.99
CAT137	3/8" Keyless Reversible Drill	£34.99	£41.99
CAT139	150mm Air Hammer inc 4 Chisels	£19.98	£23.98

**Clarke ARC ACTIVATED HEADSHIELDS**

CWH6

FROM ONLY **£39.98** EX VAT  
**£47.98** INC VAT

CWH7

FROM ONLY **£44.99** EX VAT  
**£53.99** INC VAT

• Activates instantly when Arc is struck
- Protects to EN379 - Suitable for arc, MIG, TIG & gas welding

PRICE CUT **£49.98** EX VAT  
**£59.98** INC VAT

WAS £55.99 inc. VAT

**Clarke NO GAS/GAS MIG WELDERS**

• Professional type torch with on/off control
- Thermal overload protection
- Turbo fan cooled
- Easy conversion to gas with optional accessories

FROM ONLY **£109.99** EX VAT  
**£131.99** INC VAT

MIG145

no gas only # was £203.98 inc. VAT

MODEL	MIN/MAX AMPS	EXC. VAT	INC. VAT
MIG 120NG*	35/90	£109.98	£131.98
MIG 145	35/135	£149.98	£179.98
MIG 152*	40/140	£164.98	£197.98
MIG 180	40/160	£179.98	£215.98
MIG 196	40/180	£199.98	£239.98

**Clarke ANTI FATIGUE FOAM FLOORING**

• 6 interlocking foam tiles protect flooring & provide comfort when standing or kneeling
- Ideal for use in garages, workshops etc.
- Each tile is 610x610mm & includes detachable, yellow borders

FROM ONLY **£19.98** EX VAT  
**£23.98** INC VAT

FOR 6 TILES

**Clarke HYDRAULIC PRESSES**

PROFESSIONAL QUALITY

Built for tough daily use in automotive/industrial workshops
- All models include gauge

MODEL	EX VAT	INC VAT
4 ton bench*	£129.98	£155.98
10 ton bench*	£189.98	£227.98
12 ton floor*	£239.98	£287.98
20 ton floor*	£399.00	£478.80
50 ton floor*	£1649.00	£1978.80

\* Available with/without p ce pin, bracket & pressing plate #Without kit

FROM ONLY **£129.98** EX VAT  
**£155.98** INC VAT

**Clarke HEAVY DUTY PROFESSIONAL TOOL CHESTS & CABINETS**

The ultimate in tool storage!

FROM ONLY **£119.98** EX VAT  
**£143.98** INC VAT

• Ball bearing drawers

MODEL	DESCRIPTION	DIMS WxDxH (mm)	EX VAT	INC VAT
CBB206B	6 Dr Chest	710x328x365	£99.98	£119.98
CBB209B	9 Dr Chest	710x315x420	£119.98	£143.98
CBB210B	10 Dr Chest	710x315x475	£139.98	£167.98
CBB203B	3 Dr step up cabinet	710x315x250	£69.98	£83.98
CBB215B	5 Dr Cabinet	758x468x1815	£199.98	£239.98
CBB212B	3 Dr Cabinet	755x470x1810	£169.98	£203.98
CBB217B	7 Dr Cabinet	758x468x1815	£249.98	£299.98
CBB213B	3 Dr Cabinet	758x418x1815	£199.98	£239.98

**Clarke NO GAS/GAS MIG WELDERS**

• Uses flux cored steel wire, which creates own gas shield as it burns

FROM ONLY **£169.99** EX VAT  
**£203.99** INC VAT

MODEL	AMPS	EXC. VAT	INC. VAT
90EN	24-90	£169.98	£203.98
105EN	30-100	£184.99	£221.99
151EN	30-150	£209.98	£251.98
160EN	30-150	£259.98	£311.98

**Clarke ARC WELDERS**

For home user, automotive and industrial applications.

FROM ONLY **£46.99** EX VAT  
**£56.99** INC VAT

MODEL	AMPS	EXC. VAT	INC. VAT
EA110	40-100	£46.99	£56.99
105N*	40-100	£49.98	£59.98
EA165	65-160	£62.99	£75.59
115N	30-110	£64.99	£77.99
EA200	60-200	£89.98	£107.98
160N	40-150	£67.99	£81.59
190N	50-185	£94.99	£113.99
190TEN#	35-180	£139.98	£167.98
235TEN#	40-210	£149.98	£179.98

# Turbo fan cooled  
\* was £71.99 inc. VAT

**Clarke ANGLE GRINDERS**

FROM ONLY **£19.98** EX VAT  
**£23.98** INC VAT

CAG800

INC. DISC & HANDLE

**Clarke ENGINE CRANES**

FROM ONLY **£144.99** EX VAT  
**£173.99** INC VAT

MODEL	DESC.	EX VAT	INC VAT
CFC500F	1/2 ton folding	£144.99	£173.99
CFC100	1 ton folding	£149.98	£179.98
CFC1000LR	1 ton long reach	£189.98	£227.98

Folding and fixed frames available
- Robust, rugged construction
- Fully tested to proof load
- Overload safety valve

**Clarke MECHANICS PROFESSIONAL TOOL CHESTS/ CABINETS**

FROM ONLY **£52.99** EX VAT  
**£63.99** INC VAT

35KG MAX DRAWER LOAD

• Includes BALL BEARING

MODEL	DESC.	WxDxH (mm)	EX VAT	INC VAT
CTC600B	6 Dr chest	600x260x340	£52.99	£63.99
CTC900B	9 Dr chest	610x255x380	£64.99	£77.99
CTC500B	5 Dr cabinet	675x335x770	£119.98	£143.98
CTC800B	8 Dr chest/cab set	610x330x1070	£104.99	£125.99
CTC700B	7 Dr cabinet	610x330x875	£129.99	£149.99
CTC1300B	13 Dr chest	620x330x1320	£149.98	£179.98

\* was £155.98 inc. VAT

**Clarke MIG WELDERS**

Quality machines from Britain's leading supplier

See online for included accessories

FROM ONLY **£179.98** EX VAT  
**£215.98** INC VAT

MODEL	MIN-MAX AMPS	EX VAT	INC VAT
PRO90	24-90	£179.98	£215.98
110E	30-100	£214.99	£257.99
135TE Turbo	30-130	£239.98	£287.98
151TE Turbo	30-150	£269.98	£323.98
165TEM Turbo	30-155	£339.00	£406.80
175TECM Turbo	30-170	£409.00	£490.80
205TE Turbo	30-185	£449.98	£539.98

**Clarke 24V CORDLESS IMPACT WRENCH**

CIR220 only **£89.99** EX VAT  
**£107.99** INC VAT

HEAVY DUTY

- Inc. 17, 19, 21 & 23mm chrome vanadium sockets
- 2x 24v Ni-Cd Batteries & 1 hour battery charger

OTHER MODELS: MAX TORQUE EX. VAT INC. VAT

MODEL	MAX TORQUE	EX. VAT	INC. VAT
Corded CEC1000	450Nm	£56.99	£68.39
Cordless CIR450B	450Nm	£119.98	£143.98

**Clarke 329 HAND TOOLS**

• This great value set includes CTC900B 9 drawer chest & CTC500B 5 drawer cabinet
- Includes the most popular sockets, spanners, pliers, drivers, wrenches etc

FROM ONLY **£259.98** EX VAT  
**£311.98** INC VAT

**Clarke PACKAGE DEAL**

TOOL CHEST AND TOOLS

SAVE OVER £62 OFF OUR NORMAL PRICE

ALL THIS ONLY **£259.98** EX VAT  
**£311.98** INC VAT

329 HAND TOOLS

**Clarke PACKAGE DEAL**

TOOL CHEST AND TOOLS

SAVE OVER £62 OFF OUR NORMAL PRICE

ALL THIS ONLY **£259.98** EX VAT  
**£311.98** INC VAT

329 HAND TOOLS



### Clarke JUMP STARTS

Provides essential home, garage and roadside assistance

- Integral work light
- 910 includes air compressor
- Long life battery

**FROM ONLY £49.98 EX VAT**  
**£59.98 INC. VAT**

MODEL	START BOOST	PEAK AMPS	EX VAT	INC VAT
900	400A	900A	£49.98	£59.98
910	400A	900A	£59.98	£71.98
4000	700A	1500A	£109.98	£131.98
12/24 1000A@12v 2000A@12v			£129.98	£155.98
500A@24v 1000A@24v				

**EXTRA LONG 1m LEADS**  
**HEAVY DUTY 17KG**

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### Clarke HEAVY DUTY INSTANT GARAGES/WORKSHOPS

• Ideal for use as a garage/workshop • Extra tough triple layer weatherproof fabric • Heavy duty powder coated steel tubing • Ratchet tight tensioning

**NEW! 10' RANGE NARROWER WIDTH GREAT WHERE SPACE IS TIGHT**

**ZIP CLOSE DOOR**

**FROM ONLY £219.00 EX VAT**  
**£262.00 INC. VAT**

**LENGTH UP TO 24'**

MODEL	SIZE (LxWxH)	EXC. VAT	INC. VAT
CIG1015	4.6 x 3 x 2.4M	£219.00	£262.80
CIG1216	4.9 x 3.7 x 2.6M	£249.00	£298.80
CIG1020	6.1 x 3 x 2.4M	£269.00	£322.80
CIG1220	6.1 x 3.7 x 2.5M	£299.00	£358.80
CIG1224	7.3 x 3.7 x 2.5M	£379.00	£454.80

### Clarke SPRAY GUNS

**HUGE CHOICE IN-STORE/ONLINE**

**FROM ONLY £19.98 EX VAT**  
**£23.98 INC. VAT**

MODEL	DESCRIPTION	EX VAT	INC VAT
PRO12C	1.2mm, 14C/18C	£19.98	£23.98
PGF14	Pro. Gravity	£26.99	£32.39
SP14/18C	1.4mm, 1.8mm	£27.99	£33.59
HVLP	AP15, 2.2mm	£27.99	£33.59

### Clarke TAP & DIE SETS

**FROM ONLY £14.99 EX VAT**  
**£17.99 INC. VAT**

• High quality tungsten steel  
• Supplied in metal storage case, except 16pce

TYPE	EX VAT	INC VAT
16pce Metric	£14.99	£17.99
24pce UNC/NF/NPT	£19.98	£23.98
28pce# Metric	£23.99	£28.79
33pce# Metric/UNF/BSP	£31.99	£38.39
32pce Metric	£41.99	£50.39

#28pce Best Budget Buy, 33pce Recommended.

### Clarke HEAVY DUTY PETROL POWER WASHERS

**FROM ONLY £179.98 EX VAT**  
**£215.98 INC. VAT**

Honda & Diesel engine models available

**PLS190N**

MODEL	MAX ENGINE	EX VAT	INC VAT
Tiger 1700	1595psi	£2.6	£179.98
Tiger 2500	2465psi	£4	£249.98
Tiger 2900	2900psi	£6.5	£299.98
PLS190N	2697psi	£6.5	£379.98
PLS260N	3625psi	£13	£569.00

### Clarke PARTS WASHERS

**FROM ONLY £39.98 EX VAT**  
**£47.98 INC. VAT**

**WASHER FLUID FROM £4.99 EX VAT**  
**£5.99 INC. VAT**

MODEL	TANK CAP.	TYPE	EX VAT	INC VAT
CW2D	10Ltrs	Bench	£39.98	£47.98
CW1D	45Ltrs	Floor	£99.98	£119.98
CW2M	22.5Ltrs	Floor	£139.98	£167.98
CW4D	75Ltrs	Floor	£159.98	£191.98

### Clarke ENGINE DIAGNOSTICS

**FROM ONLY £39.98 EX VAT**  
**£47.98 INC. VAT**

MODEL	EX VAT	INC VAT
EOBD Fault Code Reader	£39.98	£47.98
Engine EOBD/OBD2	£54.99	£65.99
Fault code reader		
Engine Diagnostic & EOBD/OBD 2 Fault Code Reader	£99.98	£119.98

### Clarke INVERTER GENERATORS

**PRICE CUT**

**FROM ONLY £229.98 EX VAT**  
**£275.98 INC. VAT**

**IG1000**

**IG2200**

Produces pure sine wave & stable power, essential for computers & sensitive equipment

- Max output: IG1000, 1000W Max output: IG2200, 2200W
- 4 stroke engine • Super quiet running (only 64dBA at 7M 1/4 load)
- Low oil shut down
- Ideal for caravanning, and boating etc.

**£389.98 EX VAT**  
**£467.98 INC. VAT**

### Clarke DRILL PRESSES

**FROM ONLY £59.98 EX VAT**  
**£71.98 INC. VAT**

**CDF5EB**

**CD53**

**DRILL STANDS**

**ONLY £19.98 EX VAT**  
**£23.98 INC. VAT**

Drill not included

### Clarke MECHANICS MOBILE SEAT

**FROM ONLY £14.99 EX VAT**  
**£17.99 INC. VAT**

• Strong steel frame  
• 4 strong rubber wheeled castors with easy swivel ball bearings  
• Oil resistant padded vinyl seat  
• Integral storage tray

**CMS1**

### Clarke BOLTLESS QUICK ASSEMBLY STEEL SHELVING

**FROM ONLY £29.98 EX VAT**  
**£35.98 INC. VAT**

• Simple fast assembly in minutes using only a hammer

**ASSEMBLES AS BENCH OR CORNER UNIT**

**CHOICE OF 5 COLOURS**  
RED, BLUE, BLACK, SILVER & GALVANISED STEEL

### Clarke 3-IN-1 SHEET METAL MACHINES

**FROM ONLY £169.98 EX VAT**  
**£203.98 INC. VAT**

• Bend, Roll & Shear metal up to 1mm thick • Min. Rolling Diameter 39mm • Bending angle 0-90°

MODEL	BED WIDTH	EX VAT	INC VAT
SBR305	305mm	£169.98	£203.98
SBR610	610mm	£349.00	£418.80

### Clarke HEAVY DUTY PRO CHEQUER CANOPIES

**CC20**

• Super strong, water-resistant, UV treated fabric • Powder-coated steel frame • Fast pop-up design

MODEL	SIZE (LxWxH)	PEAK HEIGHT	EXC. VAT	INC. VAT
CC10	3x3x2m	3.1m	£94.99	£113.99
CC12	3.7x3.7x2.1m	3.3m	£109.98	£131.98
CC15	3x4.6x2.2m	3.4m	£164.99	£197.99
CC20	3x6.1x2.1m	3.4m	£219.00	£262.80

### Clarke POLISHING KITS

**Kit Inc: Tapered spindle, Coloured mop for initial cleaning, pure cotton mop for high polish finish & polishing compound**

4"	6"	8"
£19.98 Ex VAT £23.98 Inc VAT	£24.99 Ex VAT £29.99 Inc VAT	£29.98 Ex VAT £35.98 Inc VAT

**FROM ONLY £19.98 EX VAT**  
**£23.98 INC. VAT**

### Clarke GENERATORS

**FROM ONLY £89.98 EX VAT**  
**£107.98 INC. VAT**

Honda engine models available

**CHECK FRAME TYPE WHEN ORDERING**

**was £191.98 inc. VAT**

MODEL	KVA	HP	EX VAT	INC VAT
G720	0.7	-	£89.98	£107.98
G1200+	1.1	-	£149.98	£179.98
FG2500	2.4	6.5	£189.98	£227.98
FG3005	2.8	7	£229.98	£275.98
FG3050	3	8	£359.00	£430.80
FG4050ES	4.5	11	£469.00	£562.80
FG5100ES	5.5	13	£539.00	£646.80

### Clarke STRUT SPRING COMPRESSOR

**1000**

• Foot operated hydraulic powered  
• Adjustable for springs up to 350mm dia. & 254mm in length  
• Yoke travel: 340mm  
• Weight 31.5kg

**SSC1000**

**£99.98 EX VAT**  
**£119.98 INC. VAT**

### Clarke GIANT FANS

**FROM ONLY £99.98 EX VAT**  
**£119.98 INC. VAT**

**CAM6000**

MODEL	SIZE	EXC. VAT	INC. VAT
CAM24	24"	£99.98	£119.98
CAM30	30"	£139.98	£167.98
CAM36	36"	£169.98	£203.98
CAM5002	24"	£139.98	£167.98
CAM6000	30"	£179.98	£215.98

**UP TO 36"**

### Clarke WET & DRY VACUUM CLEANERS

**FROM ONLY £47.98 EX VAT**  
**£57.98 INC. VAT**

• SS = Stainless Steel

• A range of compact, high performance wet & dry vacuum cleaners for use around the home, workshop, garage etc.

MODEL	MOTOR CAPACITY WET/DRY	EX. VAT	INC. VAT
CVAC20P	1250W	£47.99	£57.59
CVAC20SS*	1400W	£59.98	£71.98
CVAC25SS*	1400W	£64.99	£77.99
CVAC30SS*	1400W	£86.99	£104.39

### Clarke BENCH GRINDERS & FLOOR STANDS

**FROM ONLY £27.99 EX VAT**  
**£33.99 INC. VAT**

• Stands come complete with bolt mountings and feet anchor holes

**STAND FROM ONLY £41.99 EX. VAT £50.39 INC. VAT**

**FROM ONLY £27.99 EX VAT**  
**£33.99 INC. VAT**

CBG8W features 8" whetstone & 6" drystone.

# With sanding belt

MODEL	DUTY	WHEEL DIA.	EX VAT	INC VAT
CBG6RP	DIY	150mm	£27.99	£33.59
CBG6RZ	PRO	150mm	£37.99	£45.59
CBG6RSB	HD	150mm	£47.99	£57.59
CBG6SB*	PRO	150mm	£49.98	£59.98
CBG6RWC	HD	150mm	£54.99	£66.99
CBG8W (wet)	HD	150/200mm	£55.99	£67.19

### Clarke ELECTRIC POWER HOISTS

**FROM ONLY £74.99 EX VAT**  
**£89.99 INC. VAT**

• Includes remote control • 230V motor

MODEL	CABLE	MAX LOAD (KG)	LIFT HEIGHT	EX VAT	INC VAT
CH2500B	Single	125	12M	£74.99	£89.99
CH4000B	Double	250	6M		
CH4000B	Single	200	12M	£99.98	£119.98
CH4000B	Double	400	6M		

**INCLUDES REMOTE CONTROL**

### Clarke SOCKET SETS

**ONLY £22.99 EX VAT**  
**£27.99 INC. VAT**

Top quality chrome vanadium steel.

- 18 Sockets 8-32mm
- Reversible ratchet
- Comfort grip handle

**PRO155**

**HUGE RANGE OF RATCHETS, SPANNERS AND SOCKET SETS**

**ONLY £69.98 EX VAT**  
**£83.98 INC. VAT**

**PRO234 62 PIECE 1/2" & 1/4" SOCKET & BIT SET**

**1 1/2" TORQUE WRENCH - CHT141**

• 5" Extension bar • 1/2" - 3/8" adaptor • 28-210 Nm

only £19.98 EX VAT  
£23.98 INC VAT

### Clarke ENGINE STANDS

**FROM ONLY £49.98 EX VAT**  
**£59.98 INC. VAT**

**CES500A**

- Rotates through 360°
- Engines up to 227kg

**Only £49.98 EX VAT**  
**£59.98 INC. VAT**

**CES750A (SHOWN)**

- Rotates through 360°
- Engines up to 340kg
- Includes tool tray

**Only £69.98 EX VAT**  
**£83.98 INC. VAT**

### Clarke VAC KING

**FROM ONLY £47.98 EX VAT**  
**£57.98 INC. VAT**

• SS = Stainless Steel

• A range of compact, high performance wet & dry vacuum cleaners for use around the home, workshop, garage etc.

MODEL	MOTOR CAPACITY WET/DRY	EX. VAT	INC. VAT
CVAC20P	1250W	£47.99	£57.59
CVAC20SS*	1400W	£59.98	£71.98
CVAC25SS*	1400W	£64.99	£77.99
CVAC30SS*	1400W	£86.99	£104.39

### Clarke BODY REPAIR KITS

**FROM ONLY £79.98 EX VAT**  
**£95.98 INC. VAT**

**CS10BRK**

- Fast snap connector attachments for quick & easy assembly • Hydraulic pump, ram & hose with various tubes, pieces & connectors
- Includes metal case
- Fast action pump

MODEL	CAPACITY	EX. VAT	INC. VAT
CS4BRK	4 tonne	£79.98	£95.98
CS10BRK	10 tonne	£139.98	£167.98
CS10SBRK*	10 tonne	£149.98	£179.98

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CS10BRK	10 tonne	£139.98	£167.98
CS10SBRK*	10 tonne	£149.98	£179.98

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CS4BRK	4 tonne	£79.98	£95.98
CS10BRK	10 tonne	£139.98	£167.98
CS10SBRK*	10 tonne	£149.98	£179.98

## VISIT YOUR LOCAL SUPERSTORE

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B'HAM GREAT BARR 4 Birmingham Rd,	0121 358 7977	GATESHEAD 50 Lobley Hill Rd, NE8 4YJ	0191 493 2520	NORWICH 282a Heigham St, NR2 4LZ	01603 766402
B'HAM HAY MILLS 1152 Coventry Rd, Hay Mills	0121 7713433	GLASGOW 280 Gt Western Rd, G4 9EJ	0141 332 9231	NOTTINGHAM 211 Lower Parliament St,	0115 956 1811
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BRIGHTON 105-107 Manningham Lane, BD1 3BN	01274 390962	GRimsby 57 Ellis Way, DN32 9BD	01472 354435	PLYMOUTH 58-64 Embankment Rd, PL4 9HY	01752 254050
BRISTOL 1-3 Church Rd, BNS 3QB	0117 935 1060	HULL 8-10 Hollerness Rd, HU9 1EG	01482 223161	POOLE 137-139 Bournemouth Rd, Parkstone	01202 717913
BURTON UPON TRENT 12a Lichfield St, DE14 3QZ	01283 564 708	ILFORD 746-748 Eastern Ave, IG2 7HU	0208 518 4286	PORTSMOUTH 277-283 Copnor Rd, Copnor	023 9265 4777
CAMBRIDGE 181-183 Histon Road, Cambridge, CB4 3HL	01223 326275	IPSWICH Unit 1 Ipswich Trade Centre, Commercial Road	01473 221253	PRESTON 53 Blackpool Rd, PR2 6BU	01772 703263
CARDIFF 44-46 City Rd, CF24 3DN	029 2046 5424	LEEDS 227-229 Kirkstall Rd, LS4 2AS	0113 231 0400	SHEFFIELD 453 London Rd, Heeley, S2 4HJ	0114 258 0831
CARLISLE 85 London Rd, CA1 2LG	01228 591666	LEICESTER 69 Melton Rd, LE4 6PN	0116 261 0688	SIDCUP 13 Blackden Parade, Blackfen Rd,	0208 3042069
CHELTENHAM 84 Fairview Road, GL52 2EH	01242 514 402	LINCOLN Unit 5, The Pelham Centre, LN5 8HG	01522 543 036	SOUTHAMPTON 516-518 Portsmouth Rd,	023 8055 7788
CHESTER 43-45 St. James Street, CH1 3EY	01244 311258	LIVERPOOL 80-88 London Rd, L3 5NF	0151 709 4484	SOUTHE 1139-1141 London Rd, Leigh on Sea	01702 483 742
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# Race Diaries

Some seasons are now under way, others not. But either way, our Race Diaries contributors have been kept busy by their motorsport activities, whether on the circuit, at an autotest, on the hill or in the garage.



## Jack Walton

**DISCIPLINE**  
Circuit racing

**RACES**  
Pro Comp LA Gold

**CHAMPIONSHIP/SERIES**  
750MC Sports Specials

**AGE**  
56

**OCCUPATION**  
Production supervisor

I like a car with a bit of history. The Tiger Avon I have just sold was one of those. The Pro Comp LA Gold I now have is no different. I have the article from the 2000 August/September issue of *Kit Cars International* to back this up. It was originally raced very successfully by Mike Topp in the 750 Motor Club ACS Limited Kit Car Championship. Mike won one championship outright and, I believe, three class championships during this period while the car was fitted with a highly tweaked Ford CVH engine.

The car has completed surprisingly few miles considering its age. Or it was surprising until I called Mike Topp and filled in the blanks. It could be that, at one point, it spent the best part of 10 years under a dust sheet. The SPA Micro-Dash which was fitted to the car new shows less than 700 miles and the powdercoat on the chassis bears this out. Having shown Mike recent photos of the car, nothing much appears to have changed apart from the 1.8-litre Zetec engine it now runs.

Having previously raced under the RAFMSA banner, I swiftly contacted the 750 Motor Club and joined up, thus enabling me to run in its Sports Specials Championship. Cadwell Park was the next date on the calendar and it was time to get organised.

In line with all my previous racing, everything felt like it was last minute. With the ever-willing assistance of number one mechanic, Rachel, we set to. I found some tow straps in the bottom of my spares box. TRS came to the rescue with a fine set of 6-point belts and Peter Lloyd Rallying with a fire extinguisher. The previous one appeared to be 15 years old and had not been serviced in the last six years. The whole car was spanner checked and the SPA dash burst into life for the first time in months apparently. It did take me all day to find that a faulty front right indicator was what kept blowing the fuse that also covered the dash. A seat was hastily made by butchering the previous owner's bag seat and an expanding foam packaging bag I had as a sample from the manufacturer. Lengths of gaffer tape later and a workable seat/couch was produced.

I knew very little about what the LA Gold would do. My testing had consisted of driving it onto the trailer.

Timings for the weekend were pretty



**Above:** Jack's first proper drive of his LA Gold was in the race at Cadwell Park. In at the deep end!

relaxed with loads of time between our races. We arrived on Friday evening to see a virtually full paddock. A lot of people must have been testing, as even those not racing until Sunday had set up camp. We found loads of space right at the top of the field, but it did mean a long walk to get anywhere. Note to self: pack push bike next time. With scrutineering not until 10:45 on Saturday and qualification at 11:45 there was no rush on Saturday morning.

Scrutineering went off without a hitch, not one commented about my Roary the Racing Car catch tanks. But several of the long-serving members of the 750MC recognised the car from its previous racing career. The colour scheme has not changed in 15 years.

I had few expectations of qualification and was not disappointed. I missed gears, braking points and apexes. At this point (three laps in), barely time to warm up, the session was red flagged when a sump plug fell out of a MEV.

My qualifying time was indicative of the amount of seat time I have enjoyed with this car and my lack of track time and, more importantly, my confidence

in it and my ability. Up to qualifying, my seat/track time consisted of me loading the car onto the trailer. OK, that's not strictly true: I did get the car up to second gear while taking it to scrutineering and back.

Race one was not until 16:35. I had forgotten how much I have missed championship type racing, even though I was well off the pace. A MEV bogged down on the start, ruining any hope of a clean get away by me. I then tried hard to keep up. I need much more practice. Five laps in and red flag, again, and a very bent Striker at Mansfield. I was getting a little more information from the car, but nothing from the all singing and dancing SPA Dash. This piece of kit will be removed over the winter if not before. Reason: On a very compact screen, it pumps out constant information from lap times, mph, rpm, oil pressure, oil

**Below:** Roary the Racing Car oil catch tank.



**Below:** Too much info! Dash will be changed.



**"In line with all my previous racing, everything felt like it was last minute"**





Above: Car appeared in and old issue of *Kit Cars International*.

temperature, water temperature, front and rear brake pressures and, just for good measure, an accelerometer for track-logging. I don't think my brain will work quickly enough or that my eyesight is good enough to take in all that information at once. It produces loads of what I am sure is valuable information, but this piece of kit is for a data loving geek who will make more use of it than I ever will.

The race restarted and I came out of Charlie's to find Paul Dudley having a grassy moment having pinged the tyre wall on the right at the beginning of Park Straight. It would of course be ungentlemanly to remind him that I had beaten him, but I will make the effort.

At this point, I was happy not to have broken or stacked a car that I knew so little about. This did not take away the need for an ice cold beer in the paddock as soon as I got out of the car. I had also forgotten how much I like Kronenbourg. Paul Dudley also appears to be a fan.

Race two on Sunday at a leisurely 16:00. The sky had been closely watched up to this point with massive rain clouds interspersed with sunny holes in them. Thankfully we got out in one of these holes. Prior to the race, old friends from the RAFMSA, Nick and Mark Rogers, appeared. They told me how old I was getting, how much weight I had put on and then informed me they intended to catch all my embarrassing moments on camera. Thankfully none of their photos in this article shows me pointing the wrong way. Thanks chaps.

Again, what I am certain is the same MEV, bogged on the start. Go past you say, but a check in the mirror showed that the championship leader, having missed race one with a broken clutch cable, was right behind me and overtaking. It would not be a good welcome to 750MC by crashing into him. Worse still, the championship leader is Adrian Cooper who was driving the only other LA Gold.

I felt happier with the car and pushed slightly more, but it would only rev to just over 6000rpm. It is fitted with one of those Megasquirt things. This too may have to go over the winter, unless anyone knows of a rolling road that is not a million miles away that can fettle such things. So I settled into what had become a test session really, for me and the car.

Lessons learnt. First impressions are that this is probably the best handling race car I have owned. The fuel pump sounds more like a jack hammer, yet works well. This could become a spare very soon. The Megasquirt ECU needs a good fettle as it appears to not want to rev much past 6000rpm. It is currently operating in 2D as no MAP or TPS sensor is fitted. NODIZ is looking as though it could be my next choice of ECU. I barely got through the noise test. Acousta-Fil looks like the stuff to use. Snetterton will have taken place on 1/2 August by the time you read this – the car's 15th Birthday.



## Alisdair Suttie

**DISCIPLINE**  
Hillclimbing

**RACES**  
Sylva Leader

**CHAMPIONSHIP/SERIES**  
BHC Leaders  
Championship

**AGE**  
41

**OCCUPATION**  
Motoring journalist

While my Sylva Leader may not be taking part in any competition this year, it doesn't mean it's not being used. Nor does it mean I'm not racing, so although the Sylva's progress towards being hillclimb-ready has slowed, it's still been a busy summer.

Starting with the Sylva, I've been enjoying it on the road when the weather has allowed. There is a hood with the car, but it's about as effective as a tea strainer in a monsoon. So, I prefer to pick my days and there have been enough of those to rack up nearly 1000 miles without any effort.

The only downside to using the car has been some of the local potholes have conspired to shake loose a section of exhaust that has led to a blow. As the MoT for the Leader is now due, I'll have this sorted beforehand as part of an overall pre-test check.

Like a lot of kit car owners, finding a garage to carry out the MoT has been on my mind. Yes, all MoT test stations work to the same rules, but it's finding one that understands older cars that do not necessarily have the same control layout as an everyday hatchback.

Fortunately, membership of the Stirling and District Classic Car Club has proved its worth here as several members have all recommended the same garage. Even better, it's only up the road from home, so it should hopefully be a stress-free visit to the garage.

As part of the pre-MoT checks, I'll carry out an oil change, plus filter, spark plugs and a general service. The car is running fine, but this is simply for peace of mind so I can continue to enjoy the car throughout the summer before it's taken off the road for the much-delayed engine swap this winter.

As for hillclimbing, my season with the Multi Car Hillclimb Challenge continues. Stick the name into YouTube and you can watch our efforts on video. The most recent was the Doune Hillclimb where we used a Ford Fiesta ST Mountune. It was an ideal choice for the technical twists of

Doune and we had a great weekend, even if the weather was changeable.

It was also a good event for kit car spotting, with around 10 kits competing plus several other home-built specials and single-seaters. Among the interesting kit machinery was David Baker's Ginetta 'Broomstick' G32 which was going very well. In the same class were also Melvyn Hartley's Autotune Gemini and John Lowe's Fisher Fury.

Another quirky machine was Richard Mattosian's OMS SC1, which is a dedicated racing chassis but draped with the body of a Reliant Kitten.

Below: Competitor at the Doune Hillclimb came from a formidable Reliant Kitten bodied one-off.





Given the pace and noise of this car, it's a kitten with some serious claws.

As my season continues in production cars, it would be great to

see you at Shelsley Walsh in August, where I'll be competing in an Audi S8. A bit left-field, but certainly quick.

In the meantime, I'm amassing

more parts for the Sylva's engine swap, so I must be one of the few racers looking forward to the winter lay-off!

Below: Fisher Fury was one of the kits at Doune...



Below: ...while a Ginetta G32 and an...



Below: ...Autotune Gemini were also on the entry list.



## John Pick

**DISCIPLINE**  
Hillclimbing

**RACES**  
Adrenaline Murtaya

**CHAMPIONSHIP/SERIES**  
Avon Tyres/TTC Group  
MSA Hillclimb Leaders  
Championship

**AGE**  
57

**OCCUPATION**  
Project manager/director

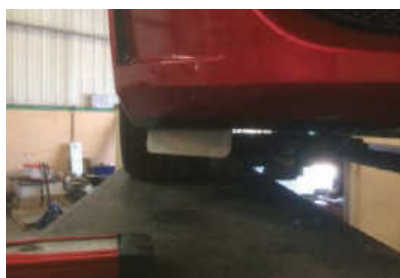


Summer has arrived and, with it, a glut of hillclimb events. So does practice make perfect? It probably should, but read on.

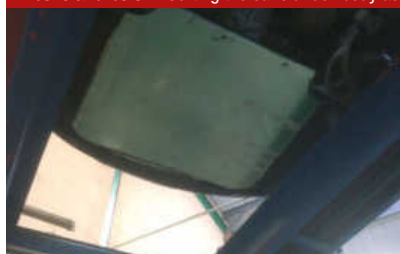
Firstly, we spent a good day on the ramp and sorted out the aero tweaks to the Murtaya that we had been planning for some time. This consisted of an under-tray that would duct the air into the radiator more effectively and then smooth the air under the front of the engine and subframe. We also added some air dams just ahead of the front wheels. Such changes can have subtle effects and the car did not feel very different, just a little more planted. The theory is that reducing lift at the front will help the front end bite in faster sections.

So where better to test it than the quickest venue, Shelsley Walsh, for the MSA Hillclimb Championship's summer visit there. Unusually for the UK summer, it was very hot and there was a very large crowd making the paddock a sea of humanity. Time was gently chiselled away and in the timed runs, both runs were 0.01 seconds apart. Given that there was no drama, it must be fairly clear that the aero work has calmed things down. Most interesting was a BMW i8 that was doing the event. The marshals had been told that, if it catches fire, let it burn! It shows how little prepared we are for our new technologies.

So to Loton Park for the next round and hooray for 4WD, it was raining. So a good start off the line and a fabulous launch round Fletchers towards Triangle bend saw us arrive with far too much speed and the resulting sideways attempt to scrub off speed on a wet track resulted in me missing the corner. The afternoon was almost dry and a good run up showed there was time in the car. So practice not helping there and then, in the morning, an enthusiastic approach to the next



Above and below: Sorting the car's under-body aerodynamics has been on the to-do list for a while.



corner saw a half spin and it all had to be strung together for the afternoon's run – which we managed, but only two visits to the top of the hill was not ideal. Certainly the car was more stable on the 'straight' which allowed it to be approached without a lift.

We have the car sorted – so what next? It is probably time the Murtaya was moved on and so it is up for sale for those who fancy the experience of driving such a fun machine – search Race Car Direct or eBay for more details.

Below: Murtaya lines up with its hybrid BMW i8 competition at Shelsley Walsh.



**"Most interesting was a BMW i8. The marshals had been told that, if it catches fire, let it burn!"**





## Ian and Chris Chapman

### DISCIPLINE

Autotesting

### RACE

Sylva Riot and Raw Striker

### CHAMPIONSHIP/SERIES

BTRDA Autotest  
Championship

### AGES

54 and 26

### OCCUPATIONS

Cabinet maker and junior  
architect

Travelling to Milton Keynes for the next round of the BTRDA autotest championship, I was looking forward to the event but not the trip down, as Chris was meeting me there. I'd replaced him with a tube of Pringles as they don't snore or drool on my window. Overtaking my friend Steve in one of the 50mph average speeds on the M1, I decided to pick up the Pringles to offer him one out the window. Unfortunately, the tube was upside down, the lid popped off covering me and the cab knee deep in Pringles. I may have grown out of my youth but I still have my immaturity. Chris and Steve thought it was hilarious when I got out of the van doing my interpretation of Lady Gaga's meat dress – Pringle pants.

The three test sites were only small but CSMA (the organisers) had drawn some cracking tests. The engine mods to the Riot seemed to be holding up OK. It only fluffed once when I got over-zealous heel and toeing on a manoeuvre. Chris was going well in his Striker, the new cold air filter we fitted had definitely made the engine sound sweeter. The patchy rain in the afternoon mixed things up a bit with some of us getting dry runs others getting wet runs. Chris got the wet ones and dropped to third over all. I could have been driving in a desert and he'd still have beaten me.

The following week, I booked both cars in at Northampton Motorsport for a day on the rollers with Troy Robinson (the Omex god). The Striker has a fuel injected engine, so Troy recommended I changed the 2-speed box to a full 4-speed for the day. I had to make an adapter plate to fit the 4-speed gearbox to the Striker's quick-release bellhousing.

The Riot's ignition-only ECU would be fine with just first gear, so I re-fitted the Riot's Omex 200. The last time it was on it ran like a bag of spanners. The idea was to pop it back on and winch it on the van for Troy to sort. You could have knocked me down with a feather when it started first time and drove fine in to the van. It must have been hard for Troy to grasp the concept of wanting to lose power low down to prevent wheelspin, but it's what we need. He decided to start with the Riot's ignition-only Omex and, apart from a small issue with the throttle pot, he sailed through the mapping on the Riot. Then came the Striker...

A concerning first power run showed only 107bhp from a 135bhp engine and, even after an hour's mapping, it still only managed to extract 119bhp. Troy's opinion as to the lack of power was that the



Above: Ian in action at the Demon Tweeks day. Mind out for those kerbs!

Striker's cam timing was one tooth out. But after all the hard runs, the clutch was starting to smell, so we called it a day. The following evening I confirmed Troy's suspicions – it was one tooth out and he keeps his tuning god status.

Demon Tweeks hosted the next round. Both cars now mapped and, with the Striker sporting approximately 20 per cent more power, the kerbs of Tweeks' car park was probably not the ideal proving ground. After the first runs, we both agreed the cars were night and day different. Chris's throttle is no longer an on/off switch as before, instead now being a progressive pedal. Normally you could take a wheel off my car and I wouldn't tell the difference, but I could this time! The best thing about my ECU map is having a rev limiter. Chris was jammy, he clipped a curb and cut his front tyre but carried on to finish the test! Then leaving the finish line on another test his clutch cable broke! I had tried some wider front tyres to

prevent understeer, but they just made it much worse. When will I learn? If it's not broke, don't fix it. ■

Below: Striker's induction kit.



Below: Chris's Striker on the rolling road at Northampton Motorsport. Riot also set-up on the same day.







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# Nip and **TUCK**







Converting a Ford Cougar into a supercar was always going to involve more than minor surgery. Wayne Cole's skills with the scalpel show he's a master of the art of nip and tuck.

**Words and pictures: CKC**

**W**ayne Cole runs his own bodyshop, so we were expecting the exterior finish on his DNA DN8 to be good. In reality, when we see it for the first time in his workshop it's rather better than that. In fact, it's unbelievable. The surface finish is incredibly smooth across all of the panels... there's really nothing here to suggest that this car doesn't have steel panels. Super smooth.

The more you examine it, the more it impresses you. While the paint



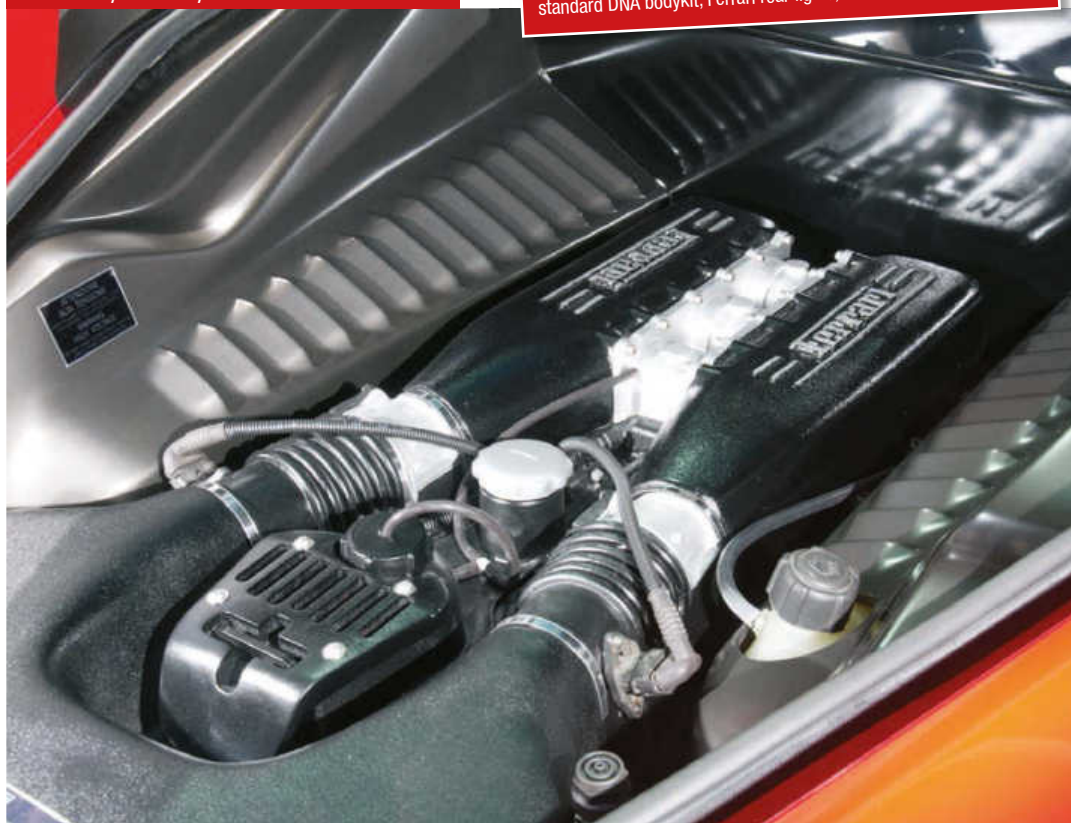




Below: Original 2.5-litre V6 almost forgotten under bonnet.



Below: Why wouldn't you think it was real?



### Tech spec

**Engine:** 2.5-litre Ford Cougar V6.  
**Gearbox:** Ford Cougar 5-speed manual.  
**Suspension:** Ford Cougar standard suspension with DNA spec lowering springs and dampers.  
**Brakes:** Standard discs and calipers front and back, with dummy 'over' discs and calipers.  
**Wheels and tyres:** 9x20in front and 10.5x20in rear alloys with 245x30 R20 front and 275x30 R20 rear Pinso PS91 tyres.  
**Interior:** Full replica 458 dashboard and other detailing, original Ferrari switches where possible.  
**Exterior:** Ferrari Rosso Corsa 322 red with unique anthracite mix, standard DNA bodykit, Ferrari rear lights, DNA front lights.

quality would not look out of place on a genuine Ferrari 458, neither would the fit and attention to detail of the exterior components. The rear light units are genuine items, so of course they look fabulous, but they are located into the fibreglass panels beautifully. And up front the headlights are DNA units... they are clearly manufactured to a very high standard, and once again the installation on Wayne's car is impossible to fault. You could not get better.

The two-tone livery on this car is inspired. As you'll know from the build of this car which we covered in the last issue, Ferrari does not offer a graphite finish (at least, not as standard) for this car, but perhaps the Italian manufacturer might want to reconsider, because this combination is a peach. What's more, Wayne's careful integration of graphite highlights within the interior and elsewhere around the car is well judged.

You may notice that the wheels are not the 5-spoke examples seen during much of the build process last month. Although they aped the factory 5-spokes on the original car, Wayne wasn't a fan and wanted wider rims to fill the arches more and give the tyres a more modern, stretched look. Having never seen the original wheels on the car 'in the flesh' it's perhaps the one change we're not quite so convinced by. But Wayne's delighted by the change, and it's his car, not ours!

If the exterior of the car is mind-blowingly impressive, then the interior goes even further. Wayne is in no doubt that getting this right was the most complicated and challenging part of the build but, wow, what an end result. This is perhaps one of the most comprehensive and impressive kit car interiors we've ever come across. All of what you see is new and none of the visible structure is retained from the Ford Cougar on which this car is comprehensively based.

Just a quick glance at the main dash area demonstrates all the different panels and materials involved, even before you look down to the centre tunnel panel (with its genuine Ferrari buttons and controls) or look up to the new roof lining and panel in front of the rear view mirror. It's an extraordinarily complex interior, and it looks amazing.

The seats are another triumph. With new fibreglass panels implanted into the exposed framework of the donor seats, the basic structure was then trimmed by Interiors Seating, who was also charged with trimming all the dash and door panels. The seats have a real production look to them, with none of the compromises normally associated with aftermarket items. They are a major





Door panels immaculately trimmed.



Modified seats created by Interiors Seating.



Great detailing on dummy control panel.

feature in convincing most people who view this car, that they are looking at the real thing.

Wayne's also particularly pleased with the carpeting and roof lining, all of which he cut and retrimmed himself. Had any of the original Cougar trim remained, the game would have been up.

What is so clever about the DNA kit is that you forget this car is actually front engine. Having spent time taking pictures of the 'engine' in the back, we only remembered at the last moment that there was actually 'another' engine under the front bonnet that we ought not forget! Viewed through the smoked rear glass, we'd defy anyone not to think that what they were looking at was anything other than genuine. Even when the rear hatch is lifted, the dummy engine looks remarkably real. With the addition of various rubber hoses, nuts, caps and other additions (along with Wayne's careful painting and detailing), it just looks fantastic.

But there is a real engine under the front bonnet. The 2.5-litre Cougar V6 ran perfectly when Wayne bought the ultra low mileage (just 30,000 miles on the clock) base vehicle for this project, and he's not interested in doing anything to it other than a basic service. It's clean, of



## Useful contacts

**The kit:** DNA Automotive, Redditch, Worcestershire. T: 0121 326 8800. E: [info@dnaautomotive.com](mailto:info@dnaautomotive.com) W: [www.dnaautomotive.com](http://www.dnaautomotive.com)

**Paint:** Beemabuild, West Bromwich, Birmingham. T: 0121 553 5550. E: [quotation@beemabuild.co.uk](mailto:quotation@beemabuild.co.uk) W: [www.beemabuild.co.uk](http://www.beemabuild.co.uk)

**Braided hoses:** Hosetechnik, Gloucester, Gloucestershire. T: 0845 838 5364. E: [info@hosetechnik.com](mailto:info@hosetechnik.com) W: [www.hosetechnik.com](http://www.hosetechnik.com)

**Trimming:** Interiors Seating, Mansfield, Nottinghamshire. T: 01623 400660. E: [info@interiorsseating.co.uk](mailto:info@interiorsseating.co.uk) W: [www.interiorsseating.co.uk](http://www.interiorsseating.co.uk)



## LOOK

This is an incredibly complicated interior. Wayne used original Ferrari buttons and controls where possible.





## LOOK

Rear lights are genuine Ferrari. Tail pipes are all used via DNA's modified back silencer. Sounds terrific. Quality of the panel finish on this car is exemplary.

course, and perhaps more importantly sounds terrific through the exhaust system that benefits from a new DNA designed back box. While it may lack the ultimate Ferrari battle cry, it's by no means an aural let down.

As Wayne drives to the photo location we can watch the reaction of bystanders from our car behind, as they turn and stare as the car cruises by. It certainly has a dramatic effect on them, and other drivers. And it's more of the same once we start on the pictures... a regular interruption from enthusiastic delivery drivers and the occupants of the business units to either side of us. A particular bonus is the arrival of two representatives from the Krispy Kreme donut factory just three units away. Without even asking, they bring a box of freshly made donuts as an offering in exchange for being able to take a few pictures of their own. We may return to this venue again!

Only MoT'd a day or two before our



Wayne Cole knows how to build a bodykit.

### MISSED PART ONE?

Read about the build in the August 2015 issue available at

[completekitcar.co.uk](http://completekitcar.co.uk)

visit, Wayne hasn't had a chance to really see what the car is like on the road. The ride is on the firm side, but he's yet to have a chance of a more extended journey. From his experience with his previous DNA 4Thirty, what Wayne does enjoy is the reaction the car gets from onlookers. Their enthusiastic appreciation of the detailing and quality of the paint is solid justification for all the work he has put into it.

Indeed, as we hinted at last month, we suspect it's the creation process that really drives him, rather than the end result. While he's certainly happy with what he's built and wants time to enjoy it now that it's finished, it's easy to see that he's already considering his next move...

DNA's West Coast clearly ticks a lot of boxes, and Wayne's particularly keen on the high quality base vehicle (Mercedes SL500) and the quality of ride and performance it will offer the West Coast conversion. But there are other potential

contenders out there as well, not least the new Porsche Boxster based conversion which Turismo is currently working on. It's another body conversion based on a high performance base vehicle which looks highly promising. For the moment, Wayne is happy to take a break from building a car, to enjoy what he's already done and to concentrate on expansion of his existing bodyshop.

While the bread and butter work for his business, Beemabuild, is panel repairs and resprays on BMWs and other premium brands, Wayne's personal enthusiasm for more involved projects ensures there's always something more interesting in the workshop. When we visited there was a Mercedes having a replica 'Black' bodykit applied, and Wayne's already done paintwork on a number of other DNA customer cars and kit cars in general. It's an area he's keen to develop, so if you have something that could benefit from his skill set, then... the doctor will see you now! ■



Dummy carbon discs and calipers look convincing.



Front headlights are created by DNA.






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# Devil in the

Having sold his previous kit car, James Grayley wasted no time in starting the next. Trouble was, the manufacturer no longer produced it...

**Words and pictures:** Ian Stent

# DETAIL





**K**it cars don't remain in production for ever (well, some do!). So what are your options if the car you really fancy building is no longer being manufactured? That was the problem facing James Grayley when he decided a Porsche 356A Coupé replica was the car for him. Porsche replica manufacturer Martin and Walker makes a number of highly respected replicas, including a Speedster, 550 and ultra rare 908 (all marketed under the Technic name). But its launch of a 356 Coupé replica back in 1998 had been met with deathly silence from the buying public, despite good reviews in the press at the time. After marketing it for a while, the company shelved it and put the moulds into deep storage.

Meanwhile, James Grayley had been busy. Although his first car had been a VW Beetle (instigating his interest for air-cooled machinery), by the age of 19 he'd bought a second-hand Westfield and ran it while he was at university. He then decided he wanted to build a kit car from the ground-up and did just that with a Ginetta G20. When that was sold a few years later he had a brief liaison with a Lotus Elise, but the building

bug was soon back and he ended up buying a unique G20 coupé built by Simon Kingsbury and which had been featured by CKC back in our May 2008 issue. James took on the Ford V6 engined car and largely rebuilt it, complete with a more powerful ST220 Ford V6. James wasn't looking to sell it, when he was contacted via a forum by a French enthusiast who wanted to buy the car. James told him it wasn't for sale, but the Frenchman tracked him down and arrived at his house with an amount of cash that James felt would be rude to refuse. Warning the Gallic driver that the G20 was now packing serious performance and that he should take it easy on the way home, as he drove off the ferry in France he then stacked the car into the nearest Armco. "It was rebuilt by Ginetta," remembers James, "having left the UK for just a few hours!"

James was straight into the next project. He'd read a piece in *Octane* magazine on the La Carrera Panamericana rally, an event originally run between 1950 to 1954 and which was then relaunched in 1988 and runs to this day. The Porsche 356 featured within the write up and it didn't take







Emerald ECU used with Jenvey throttle bodies to create a reliable and powerful 2-litre engine developing almost 130bhp.



James long to find reference to the Martin and Walker car and the company's details. But his first contact with the Thruxton based operation did not go well. Owner, Barrie Martin, was in no doubt... the car was no longer available. James could not have one. After various calls and emails James was getting nowhere, but he wasn't finished just yet. "I turned up at the Thruxton workshop and convinced him that was I was serious... that I'd built kit cars before and knew what I was doing."

Barrie reluctantly agreed that he would make James a body, along with the supporting steel sub structure... but nothing else. This was not a conventional kit and James would be on his own when it came to building it. Finally, James would have to wait until the factory had spare capacity to pull out the old moulds and create the body for him... potentially 9-12 months later. The deal was done!

Unsurprisingly, James now had plenty of time to start collecting the necessary parts and everything began falling into place perfectly. A friend asked him if he was interested in taking on an old Porsche that was decaying in a neighbour's barn. James assumed it would be something like an old 924 and declined, but was eventually persuaded to go and have a look. What he found was a genuine Porsche 356... or what was left of it. In two halves and utterly beyond restoration, James snapped up what remained... the rear screen, doorframes and handles, some internal switches... all would find their way into his new car.

If the original 356 was a miraculous find, then his next discovery was a stroke of genius. He came across a badly damaged Speedster replica which was about to be broken for parts. The Beetle chassis was largely unmarked and, vitally, had already been shortened to the correct length... all he had to do was rebody it with the new Coupé bodyshell. A fantastic result.

With time on his hands waiting for the body from Martin and Walker, James set about the chassis, comprehensively refurbishing the largely standard Beetle suspension and giving the structure a thorough clean and repaint.

His final piece of genuine luck was the engine, which turned out to be a 2.0-litre Porsche 914 unit. In scruffy condition, it needed a full rebuild and, after some online research, he dispatched it to Laurie Pettitt in Scotland. A renowned air-cooled engine builder (now retired), Laurie serviced and rebuilt the engine with lightened and balanced crank and flywheel, plus a fancy camshaft.

Sure enough, some twelve months after placing the order, Barrie Martin contacted James to say his bodyshell was ready. Taking advantage of the facilities, James trailered his rolling chassis to the workshop where the body was lowered into



place and the factory did a basic pre-fit of the doors and other opening panels.

But then it was back to James' garage which was not, as you might expect from looking at the immaculate finish he's managed, a double garage with fabulous facilities... but rather a single lock up with no power or light! Yes, really.

The build could now begin in earnest. James knew what sort of look he was after. Having been inspired by the La Carrera Panamericana rally, he was now further guided by a more recent trend in the States for performance tuning of classic Porsches, instead of restoring them to within an inch of their life. The 'Outlaw' look appealed to James, and set the tone for the whole build. On the outside, that meant a stripped back racer feel... which in turn required sourcing many parts from the States. And where he couldn't find the right part, then items had to be made. The rear engine cover hinges are a case in point. Replicas of the hinges found on lightweight racing 911Rs, James found someone on a forum who had made a set for his own project. After making contact, James had a pair for his car too.

The exposed filler cap poking out of the front bonnet was another distinctive feature. It's another 911R inspired mod, but this time can be sourced as a conversion kit. Buying a brand new fuel tank and then lining up and cutting a hole in it for the new filler neck was not a job

for the feint-hearted.

Although his car would have a stripped back race car inspiration, at no point did James want something that was uncomfortable and noisy to drive. Almost every surface of the interior was covered with Dynamat sound deadening material, before James installed brand new headlining and began making a bespoke carpet set, starting with paper templates, then automotive carpet which he then got edge trimmed. The door cards he made himself, but the door glass is in fact Plexiglas, as per the original cars and was sourced from Stoddart in the States at vast expense. While he could have made some himself, these original spec items are correctly marked.

It's this mix of meticulously sourced authentic parts and brand new modifications that makes James' car so fascinating. In tune with the Outlaw look, he's sourced a 356 full roll cage, which was welded into place in the car, but covered in modern foam lining. Elsewhere the dashboard is a slave to authenticity, however original cars never had a column stalk for the indicator, but James didn't fancy groping around on the dash to use the 'correct' toggle style switch. He found a period aftermarket indicator stalk in the States. It's an authentic 1960s upgrade, and the tip lights up when the indicator is engaged.

Perhaps the most striking feature of the



External filler cap a great addition. Lots of superb touches all over the car.



## Tech spec

**Engine:** 2.0-litre Porsche 914 engine, lightend and balanced flywheel and crank, upgraded cam, Jenvey throttle bodies, Emerald ECU, 128bhp.

**Gearbox:** 4-speed Volkswagen Beetle.

**Suspension:** Front – Red 9 Design EZ Rider double wishbones, coil-over dampers. Rear – Porsche 924 trailing arms with Red 9 EZ Rider conversion kit.

**Brakes:** Discs front and drums rear.

**Wheels and tyres:** 15in genuine Minilite alloys. 185x55 R15 Bridgestone tyres.

**Interior:** Fabricated aluminum seats with Luke harnesses. Full OMP roll cage, replica gauges, homemade carpet set and door trim.

**Exterior:** Porsche Signal Orange paint, de-bumpered exterior, streamlined mirrors, Porsche 911R rear engine cover hinges, 911R external fuel filler neck and cap.



## LOOK

While much of the car follows authenticity to the letter, James's desire to create an Outlaw style look means this is a very unique creation.





### I built this

**Name:** James Grayley  
**Age:** 36  
**Occupation:** Architect  
**First car:** VW Beetle  
**Fastest car you've been in:** Porsche 911 GT3 RS  
**Best bargain:** Original 356 parts  
**Lottery win car:** Original Porsche 904 GTS

interior is the pair of aluminium seats. Original 356 seats are quite heavy and racers of the period would replace them with the bare aluminium seats used in the competition-focused Porsche 550. Martin and Walker supplied James with a pair of fibreglass replica style seats, but when James saw a pair of the aluminium items there was no looking back... until he found the price of a reproduction pair was £2000!

More internet research led him to a company in Derbyshire that was fabricating all sorts of things in aluminium (but not seats). Not wanting to put them off the job by describing what he wanted over the phone, he drove up to see the company, taking pictures of the genuine items, along with the fibreglass replicas... a week later he collected the brand new aluminium seats.

Complete with copper rivets, they are beautifully fabricated. Finding craftsmen who can create often unique items has been a recurring pleasure for James throughout his kit building days.

The build was nearing its conclusion, but the fibreglass shell was still in its basic white primer gelcoat. James needed to decide on the colour. Although everyone was telling him it had to be silver, James was unconvinced, and when

he saw a 1970s 911 finished in the correct Signal Orange of the period, he knew he'd hit the jackpot... well, sort of. Actually, he was still very nervous about his choice.

Having found a bodyshop with extensive experience of fibreglass panels, even the bodyshop tried to dissuade him from his choice, right up until the car had been fully prepped and primed. Finally, James gave the go ahead for the orange livery... and has been delighted with it ever since.

Finally on the road two years after starting the build-up of the bodyshell, James was initially frustrated by what he'd created. The tuned 914 engine refused to run reliably on its twin Weber carbs, no matter how often he retuned them. And the ride on the standard Beetle suspension hardly seemed right for his Outlaw road racer.

The engine issues were sorted after deciding to go for fuel injection. James sourced Jenvey throttle bodies designed for a Triumph motorcycle and mounted them on his own aluminium adaptor plates. Cosworth fuel injectors seemed to provide the right fuelling, while an Emerald ECU would hopefully control everything. James was already familiar with Emerald, having used one on his previous Ginetta. Having built everything up, the car as trailered to Emerald's rolling







## Useful contacts

**356 Coupé kit:** Martin And Walker, Thruxton, Hampshire. T: 01264 773202. E: [mail@martinandwalker.co.uk](mailto:mail@martinandwalker.co.uk) W: [www.904gts.co.uk](http://www.904gts.co.uk)

**Carpet and trim materials:** Woolies, Peterborough, Cambridgeshire. T: 01778 347347. E: [info@woolies-trim.co.uk](mailto:info@woolies-trim.co.uk) W: [www.woolies-trim.co.uk](http://www.woolies-trim.co.uk)

**ECU and rolling road:** Emerald M3D, Watton, Norfolk. T: 01953 889110. E: [sales@emeraldm3d.co.uk](mailto:sales@emeraldm3d.co.uk) W: [www.emeraldm3d.com](http://www.emeraldm3d.com)

**Engine build:** Laurie Pettitt, Eyemouth, Berwickshire. T: 01890 781664. E: [actyerage@ic24.net](mailto:actyerage@ic24.net) W: <http://tinyurl.com/naxqpqj>

**Exhaust and manifolds:** Turbo Thomas, Redditch, Worcestershire. T: 07817 602239. E: [info@turbothomas.com](mailto:info@turbothomas.com) W: [www.turbothomas.com](http://www.turbothomas.com)

**Gauges:** Vintage Motorcars, California, USA. E: [info@vintagespyders.com](mailto:info@vintagespyders.com) W: [www.vintagespyders.com](http://www.vintagespyders.com)

**Porsche parts:** Roger Bray Restorations, Exeter, Devon. T: 01404 822005. E: [parts@rogerbrayrestoration.com](mailto:parts@rogerbrayrestoration.com) W: [www.rogerbrayrestoration.com](http://www.rogerbrayrestoration.com)

**Porsche parts:** PRS Services, Billericay, Essex. T: 01277 630099. E: [prs356@btconnect.com](mailto:prs356@btconnect.com) W: [www.prs356.co.uk](http://www.prs356.co.uk)

**Rollcage:** Balance Motorsport, Henfield, West Sussex. T: 01903 879111. E: [info@balancemotorsport.co.uk](mailto:info@balancemotorsport.co.uk) W: [www.balancemotorsport.co.uk](http://www.balancemotorsport.co.uk)

**Side windows:** Stoddart, Ohio, USA. E: [parts@stoddard.com](mailto:parts@stoddard.com) W: [www.stoddard.com](http://www.stoddard.com)

**Suspension upgrades:** Red 9 Design, Dinnington, South Yorkshire. T: 07538 572792. E: [info@red9design.co.uk](mailto:info@red9design.co.uk) W: [www.red9design.co.uk](http://www.red9design.co.uk)

**Throttle bodies:** Jenvey, Bridgnorth, Shropshire. T: 01746 768810. E: [sales@jenvey.co.uk](mailto:sales@jenvey.co.uk) W: [www.jenvey.co.uk](http://www.jenvey.co.uk)

**Wheels:** Minilite, Telford, Shropshire. T: 01952 620215. E: [sales@minilite.co.uk](mailto:sales@minilite.co.uk) W: [www.minilite.co.uk](http://www.minilite.co.uk)

**VW parts:** Machine 7, Nuneaton, Warwickshire. E: [sales@machine7.com](mailto:sales@machine7.com) W: [www.machine7.com](http://www.machine7.com)

road where after a quick check over, the 2-litre engine was ticking over beautifully. What's more, after a few power runs it was developing a very healthy 128bhp.

The suspension was next. We featured Red 9 Designs' replacement front suspension in last month's feature on a GP Madison. James was aware of the conversion and was also interested in the same company's rear suspension upgrade... but it was pricey. A chance opportunity to passenger ride in a car fitted with the upgrades was all James needed to convince him it would be money well spent. Bolted into his own car, the difference was immediate. "It drives like a proper sports car," enthuses James. "The difference is like night and day." The car was finally complete.

On the bright sunny day of our photoshoot at Llandow circuit, James' 356 Coupé is positively glowing! The colour choice is indeed inspired, but it's the detail finish and component choice that really delivers. On the outside it's remarkably simple, lacking the bumpers of more conventional road cars and other familiar brightwork. But what's left is beautiful, from the sculpted racing wing mirrors to the fuel filler cap and those beautiful rear engine cover hinges.

Inside, the carpet and trim look

wonderful, but there are no surprises that the aluminium seats take centre stage. They are spectacularly lovely, and a real credit to the craftsmen who created them. Remarkably, James reports they are also perfectly comfortable, despite having no padding.

James' car is now thoroughly sorted and looking immaculate, but it's also clear that he's already looking for the next challenge. As with a number of builders we meet, it's the process of assembly that really inspires James... and now the 356 Coupé is complete, his work is done.

It means the car is currently up for sale, to help fund a new and quite different project (of which we are sworn to secrecy). James is looking for £19,500 for the car and you can email him at [grayleyjames@gmail.com](mailto:grayleyjames@gmail.com) if you fancy finding out more information.

And such has been the interest in his build blog of the whole experience, that Martin and Walker has been bombarded with renewed interest from prospective customers and has resurrected its 356A Coupé replica and is now able to offer kits to those interested in building their own car. And of course one bonus of James' efforts is that you no longer have to drive down to the factory and try to persuade them to make you one! ■



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# WHAT WERE THEY THINKING?

The kit car scene has always encouraged enthusiasts to create their own one-off specials, and in the early days some people went further than others. Here we celebrate their sheer ambition!

Words: Ian Stent Pictures: CKC archives

## Sharrock Emico

**H**ow many things can you add on to your special? If you look at the bonnet of Ed Sharrock's sevenesque creation, the answer is quite a lot! Mind you, New Zealander Ed had

already had his car on the road since 1965, when he sent this picture to *Alternative Cars* in 1981, so he'd had plenty of time to adorn it.

Basis for the car appears



to have been a Ford Standard 8 chassis which was heavily modified. Ed was using a 1300cc Kent Crossflow, home-tuned to over 70bhp, and he reduced the wheel size from 16in to 13in to improve handling.

Ed called his creation the Emico, which is a Latin word which can be translated as 'leap forward'.

### Leviathan

**T**his very accomplished one-off was built by Howard Turner. The chassis was all his own work and suspension of largely Jaguar origin, as was the 3.8-litre straight six engine. The bodywork is almost certainly of Elva origin, but with a new aluminium nose and generally enlarged dimensions to accommodate the more substantial chassis and power. A great job and deserving of a full feature in 1982.

### Gnat

**T**he Mini based Gnat Sports 1000 may not quite be a one-off. According to CKC contributor and Mini specialist Jeroen Booi, as many as three may have been made by Gnat Cars between 1973 and 1975. Fellow contributor Gary Axon adds, "The styling of the Mini-based Gnat looks like it was strongly inspired

by a one-off 1968 Pininfarina P33 Roadster concept car, based on the chassis of a competition Alfa Romeo 33." If you search for that online, you'll see Gary is almost certainly correct. Good work team!



## Rover Special

**R**eminiscent of the Bentley Special we featured in issue 101, this barking creation is actually Rover based. From clues scribbled on the back of one of the prints, it would suggest it may have appeared in both *Hot Car* and possibly *Custom Car* in



around 1972. Sadly, we don't know anything more about this oddball machine.





## Dawson Special

It's only when you see the Dawson Special against another car, that the full scale is revealed. Featured in *Kit Cars* magazine in 1981, the Dawson Special had already covered 14,000 miles since it originally hit the road in 1978.

Creator, William Dawson, was looking for a vehicle that would cope with the building sites he regularly visited and decided that he'd build something to suit. He was nothing if not adventurous, buying a brand new Dodge Commando lorry in 1976, complete with 5.8-litre Perkins diesel engine. Discarding the forward located cab, he built his own bodywork to emulate the Bentley that inspired him.

Mods included a massive extension to the steering rack, removing some of the leaf springs to soften the ride and fitting different wheels. But the end result was a go-anywhere vehicle unlike anything else.

And with such robust underpinnings, you have to wonder if it still exists?



## Erm...mm...

This rather fine looking thing was bought by a K Nicholls, presumably from its original builder, back in 1982. He then wrote into *Kit Cars* magazine to see if anyone knew what it was... and they didn't. Look closely and it's actually much more swoopy than most of the 'exotica' of the time, although contributor Richard Heseltine reckons it may be a modified Group 6.



This one-off was created by a Mr L Smout in Telford. VW based, it was not on the road when this picture was taken and the owner was asking *Kit Car* magazine how to get it road legal. It's a good looking machine, so hopefully he got there in the end.



## Mystery roadster still exists?

I've spent hours scouring the archives to try and find some information on this rather accomplished traditional roadster and the reason I can't find anything is almost certainly because it heralds from pre kit car magazines.

It's quite a large car, with all aluminium bodywork, and only the angular windscreen surround and roll-over bar spoil the otherwise pleasing looks.

Unsurprisingly, we don't know who the young woman is either, but a registration check online, remarkably, suggests the number belongs to a Jaguar

240 and is still current! How amazing would that be if the car still exists. Come on someone... reveal all!



## Amazing Arkon

This amazing creation comes off the back of Dennis Adams' extraordinary Adams Probe of the late '60s and early '70s. Built in 1971 by Richard Moon and Neil Morgan, it's perhaps unsurprisingly Imp powered, but the chassis is of Triumph Spitfire origin. Of vital importance is the frankly ludicrous 33in height and the inspired name they gave their creation, Arkon.



These photos were taken by Peter Filby and Peter's ex-wife Grace can be seen giving some scale to the Arkon. As you can see above, it had crazily hinged doors in order to gain access.

What a wonderfully bonkers machine.





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# Your Letters

Got something you need to share with the kit car world? Need to let off steam about the kit car scene? Here's your chance to have your say – email us, and spread the word via this page.



## What is it?

The August issue's article on the Cholmondeley Pageant of Power has a picture above the Lotus Seven S4 and below the Lotus Mk2. Can you tell me what the car is?

Ed Keane, via email

*It's the new Ariel Nomad (we've repeated the photo above right). We wonder if it will spawn similar kit cars, in the same way the Atom has... – Ed.*



## SEND US YOURS

Tell us your thoughts on all things kit car related. Email [adam@performancepublishing.co.uk](mailto:adam@performancepublishing.co.uk)

## Another CKC subs benefit...

Forget expensive baby toys, just subscribe to *Complete Kit Car* and each month you'll get a free toy they'll love more than anything else – the address sheet.

Jason Burrage, Running Reporter

*We do our best to offer the best possible value to subscribers! – Ed.*

## Missed Midas opportunity

Some years ago on our way back from a holiday in Snowdonia, we stopped at Sussex Kitcars where we saw a very nice Midas Gold convertible for sale. It sat under a pile of small goods, but when it was made free we could see that it was in a very good shape. If my memory is right it had a MG Metro engine and the asking price was around £3000.

It was Friday night and we were in a hurry because we wanted to find a B&B around Ashford so that we could do some shopping in that nice little town before crossing the Channel on the Saturday afternoon. So we continued on our way and didn't look further at the Midas. When we arrived in Tenterden we had to realise that we wouldn't find a room for the night in that area, so we ended up in a rather expensive local hotel and we forgot about the Midas.

Once home, I saw that same Midas Gold advertised in CKC but we

didn't contact Sussex Kitcars because we didn't want to go back to the UK so soon! I still regret it! It was really a very nice refurbished little car and the price was also very good. Reading the article about the Midas anniversary (July 2015 Issue 103) reminded me of that story.

Antoine Ryckman, Belgium

## It beats a Transit

I've owned a Quantum saloon for the last 16 years since finding it in the classified ads in *Which Kit?*, but am now thinking of getting something bigger. I know I'm gonna have to get a van as I'm self-employed but I'd like something more interesting than a Transit! I looks like it will be a Model AA kit.

Chris, via email

## Nova to Reef

I have a copy of the sales literature and price lists for the Nova, and also the 1979 manual. I was originally intending to buy a kit back then, but moved into custom cars instead. I don't know if James Horsley already has a copy of these, but if not I would

be happy to part with them to a good home. Thanks for a great magazine. I am now contemplating a Dutton Reef!

Derek Ring, via email

*Thanks Derek – you'll see that James appreciates them in this month's Our Cars – Ed.*



## Letter of the month

Letter of the month wins its writer a top quality CKC fleece

### Midas in the forest

I don't buy any magazines on a regular basis, but I have to thank you for the July issue (103), with its article about the Midas. Really enjoyed it, and it's good to see a well-written article about my vehicle of choice – I built a Mk2 (Bronze) Midas in 1985, and currently have a Mk3 (Gold) which is

very slowly being returned to a roadworthy condition, with the intention of it eventually becoming my main road transport – an essential, since I live in the middle of a forest! Many thanks for publishing it.

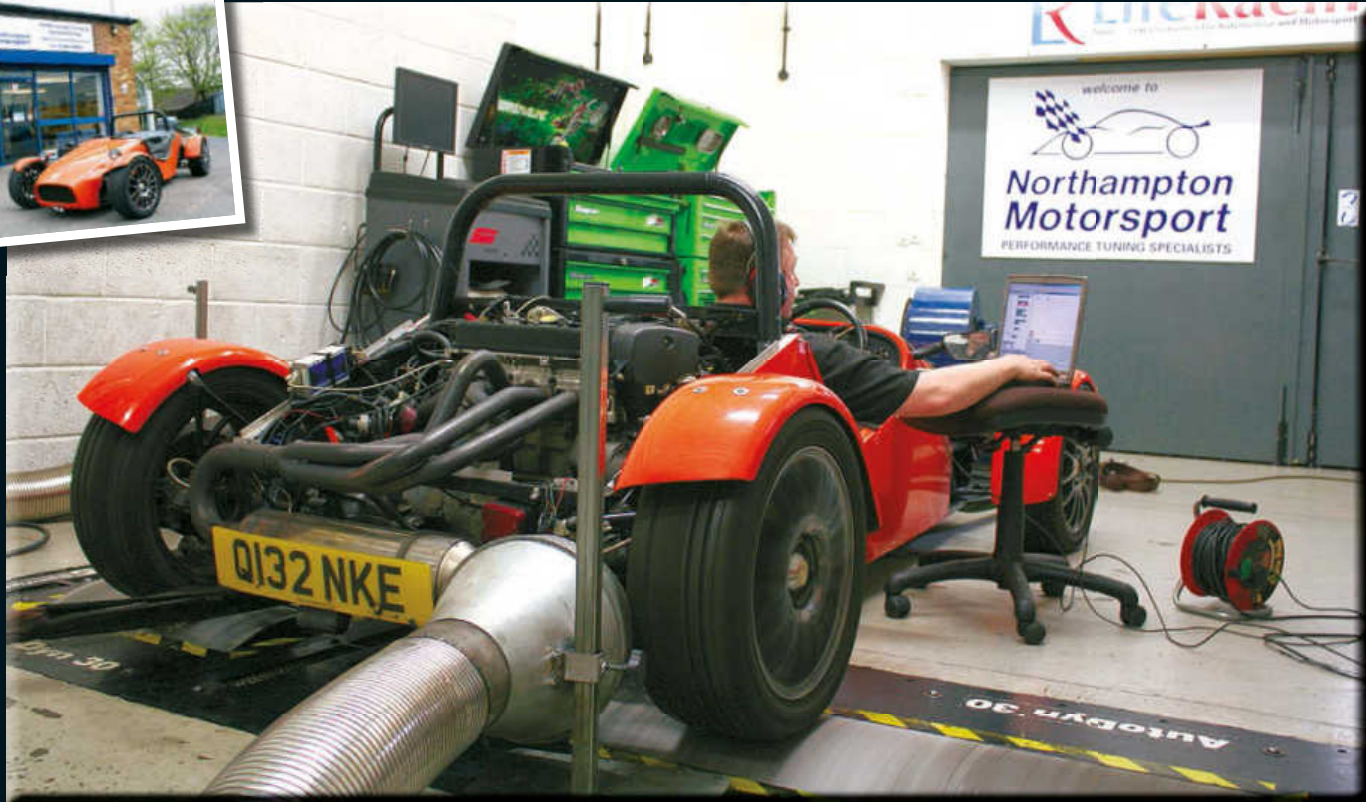
David Lees, in the middle of Scotland!





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# complete **KIT**CAR

## Workshop



Also this month:  
Win! Six pairs of pliers  
Our Cars, Kit Tips, Products

## Reader's GBS build

Jim Martin's fourth kit car,  
but his first full build



## Vinyl wrapping

Is it better than paint? John Dickens  
has his UVA Fugitive wrapped to find out

## Running Reports

Latest from our garage  
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## 3D printing

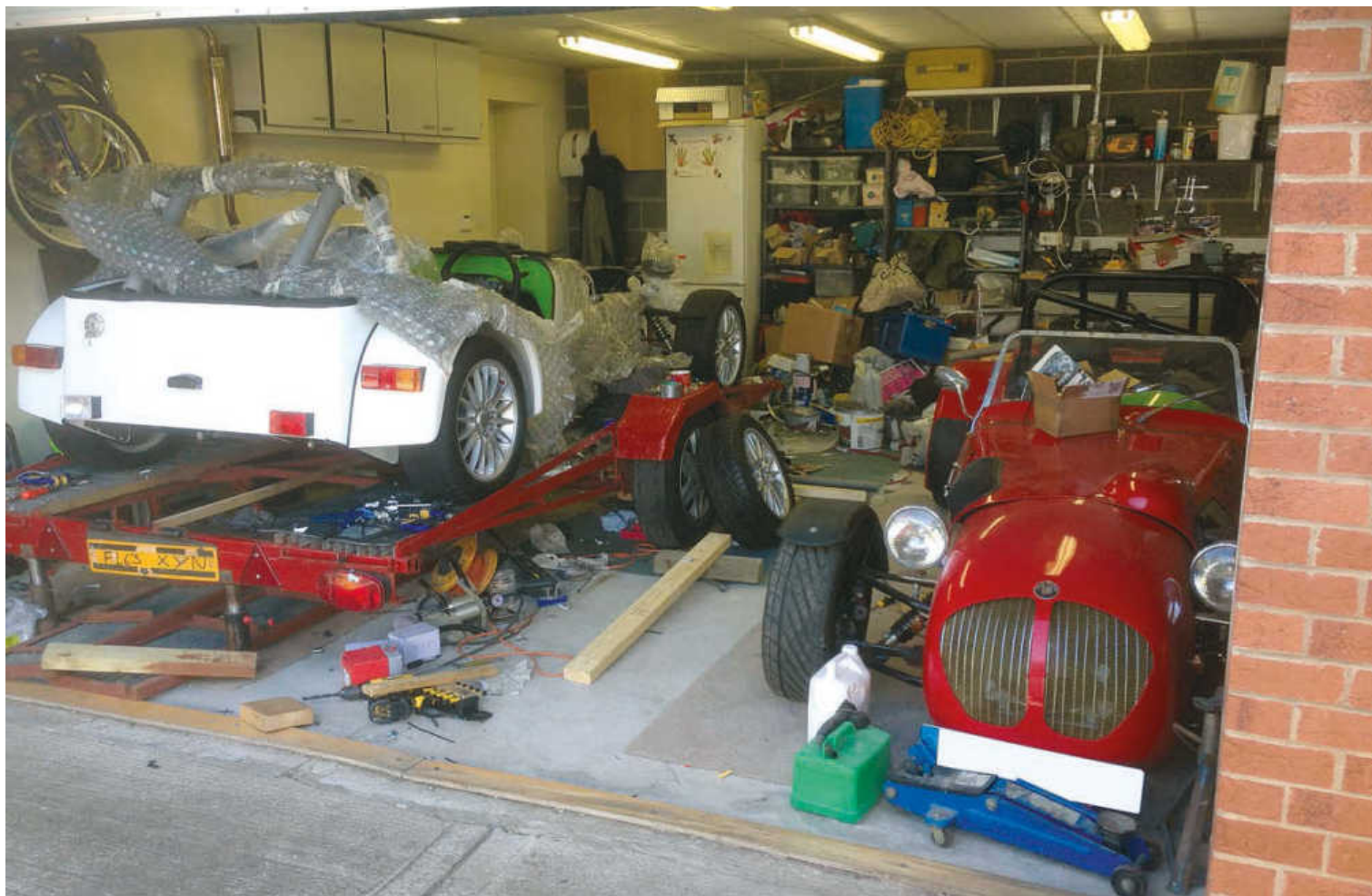
It's coming to the kit car industry  
— but when and to what extent?





# GBS Zero

Jim Martin's first kit car build was a GBS Zero, but not before he'd owned – and in some cases extensively modified – no fewer than three other kit cars. Adam Wilkins met him to discuss his most recent project...



**B**y the time he bought his first kit, Jim Martin was no stranger to the world of self-built cars. His first kit car was a Robin Hood 2B which he bought in part-built form around 15 years ago. Once he'd finished it he drove it for about three years before graduating to a Pilgrim Sumo Cobra replica. That didn't stay around for too long before he returned to the sevenesque theme with a Tiger Cub, the rare predecessor to the Cat which was distinguished by its distinctive nosecone.

It was quite old by the time Jim bought it, having been built in the 1990s, and he modernised it with a Ford Zetec engine in place of the Pinto it came with. The Tiger still occupied a space in Jim's double garage throughout the build of his next car, which was the first he bought in kit form from a manufacturer. "I'd known Richard Hall at Great British Sportscars since I had the 2B," says Jim, the fact that they got along helping him choose the GBS Zero. "The factory is only 10 minutes from home, so that made collecting parts easy as well." He was

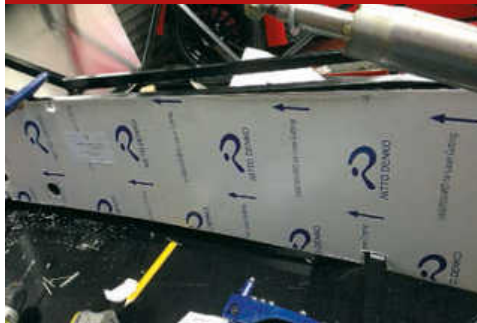
familiar with the product, too, having been in a few Zeros over the years. The GT chassis, with its additional cockpit space, was the one for him. "I just liked the car and the price," he says.

He collected a comprehensive kit in December 2013, with a couple of options. As well as being the wider GT chassis, it also has lowered floors and extra bracing for the roll-over bar. Having opted for the Mazda MX-5 basis, he also sourced all the donor components from GBS to save stripping an old car himself. With the GBS kit home, the Tiger was rolled onto Jim's

**Below:** Chassis arrives with a van-load of other parts.



**Below:** Aluminium panels going on first.



**Below:** Brake lines and wiring going in early on.







**Above:** Panels being fitted. Tiger Cub in the background.



**Above:** Exterior side panels a big job done.



**Above:** Front wishbones in place.



**Above:** Brake discs fitted and car almost on its wheels.

trailer for storage and the Zero chassis was placed on axle stands in readiness for the work.

The brake lines were first to go in, followed by the wiring. Jim then set about the car with the principle of working from the inside outwards, so the internal aluminium panelling was next to be installed. Sticking with aluminium panelling, the sides went on next, followed by the front wishbones and the rest of the front suspension.

At the rear, he set to work on the suspension and the MX-5's limited slip differential, before connecting all the brake lines that had been run in place earlier.

With the suspension on, the car just needed the wheels to go on in order to be rolled around. The Zero swapped places with the Tiger, which meant that the car could be rolled onto the trailer for a convenient working height or easily rolled back onto the floor when

necessary. Although this was Jim's first complete build, all the work he had done on his previous three kit cars stood him in good stead for the project and he was making swift progress.

The engine, gearbox and propshaft were installed in short order, although Jim had to alter the spaceframe chassis to allow space for the supercharger. Having initially intended to turbocharge the engine, after doing some research he decided it would be cheaper and



**Below:** Differential and rear suspension fitted.



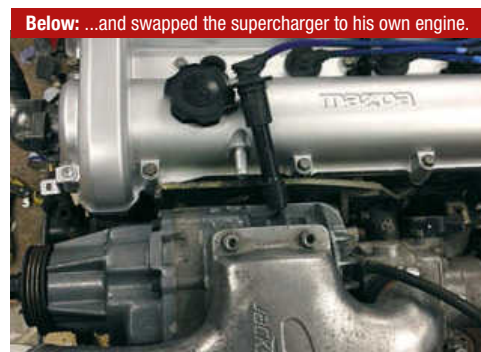
**Below:** Trial fit of most of the body panels. Already starting to look like a car.



**Below:** Zero on its wheels and swaps place with Tiger.



**Below:** Jim bought a complete supercharged engine...



**Below:** ...and swapped the supercharger to his own engine.





**Above:** Engine bay modded to accept...



**Above:** ...supercharged engine.



**Above:** Radiator was upgraded to a Coolex item to cope with extra heat of modified engine.



**Below:** Tail lights and diffuser fitted.



**Below:** Headlights on.



**Below:** Instruments fitted.

## Tech spec

**Engine:** Mazda MX-5 1.8-litre, Jackson Racing M45 supercharger, Emerald ECU, 185bhp and 156lb ft of torque.

**Gearbox:** Mazda MX-5 5-speed.

**Suspension:** Front – Double wishbones, Gaz coil-over damper, Mazda uprights. Rear – Double wishbones, Gaz coil-over damper, Mazda uprights.

**Brakes:** Front – Discs, EBC Greenstuff pads. Rear – Discs, EBC Greenstuff pads.

**Wheels and tyres:** 15in Team Dynamics Pro Race alloys, 205/50x15 Federal 595 RSR tyres all-round.

**Interior:** Smiths instruments, Savage switches, centre console for auxillary dials and switches, adjustable Roadster 7 seats, TRS harnesses, colour-coded Kawasaki green dashboard, Mazda MX-5 column switches, lowered floor.

**Exterior:** GT wide body, Kawasaki green cycle wings, Caterham style vinyl graphics, full windscreen, black windscreen frame, mirrors, grille and headlight bowls, LED headlights, Soft Bits For Sevens half hood, braced rollbar.

easier to supercharge it instead. He bought a complete engine on eBay that came with a Jackson Racing supercharger. He did that in order to get everything he needed for the conversion but, rather than fit that engine, he took the supercharger off and fitted it to the MX-5 engine he'd sourced from GBS. That's because the supercharged eBay engine was equipped with VVT, which wouldn't fit under the Zero's bonnet. It also meant that the car retained its single-donor status, which would be necessary to achieve an age-related plate later on. He had to chop out one chassis

member and relocate it – but having worked on his previous kit cars extensively, he wasn't fazed by that.

It was soon time to connect and plumb-in the engine. Right from the start, Jim knew that he was going to fit the MX-5 engine with some form of forced induction, so at this stage he upped the cooling capabilities with an aluminium radiator from Coolex in Nottingham.

With the mechanicals and bodywork fitted, Jim moved on to exterior lighting and fitting out the interior. The dash panel would ultimately receive a full set of analogue Smiths instruments, and the cockpit would be

**Below:** Seats in. Padded seats confirm this car's road-biased specification.



**Below:** Tonneau cover fitted, and the car is almost ready to be presented for IVA test.







**Above:** Exhaust silencer fitted. Jim bought a comprehensive kit, so most parts are from GBS.



**Above:** Bonnet cut out to allow for the supercharger to poke through.



**Below:** Almost ready for the IVA test...



**Below:** ...where Jim parked alongside a works Caterham van.



**Below:** Supercharger colour-coded to match the car.

carpeted. That's something we see less of these days, but this car would live up to its GT billing with padded seats, and eventually a full windscreen and weather gear.

Once the car was looking more complete, Jim took it to GBS to have the Emerald ECU fitted and mapped to the stage where the engine would tick-over, before making the journey to Emerald itself in Norfolk for a full mapping session on the rolling road. At the time, there was no map available for the 1.8-litre MX-5 engine, so it was created from scratch on Jim's car. It showed 185bhp, which is a healthy step up from its naturally-aspirated output.

When he brought the car back from Emerald, Jim set about preparing the car for its IVA test. He took the car to his local Nottingham centre and, because that's also GBS's nearest facility, the inspectors there are familiar

with the Zero. The car breezed through the test without any issues at all. Back home, there was time to add some finishing touches to the car before registration. Those Caterham inspired graphics, for instance, were completed at this stage. Jim found the generic graphics online for just £35 – including shipment from their Thailand origin!

In all, Jim thinks he spent around £13,000 building the car, although he admits to having stopped counting when he got to five figures. Although he didn't keep a record of how long the car took to build, he'd usually work on it from 9pm to 11pm for a few nights per week. Weekends were usually occupied by family duties, which is not surprising when you learn that he has

four children!

The car was registered with an age-related plate in January 2015 but, by the time we saw him at the GBS open day in June, he hadn't used the car very much. He took the car on track the following day at Blyton Park where the car performed faultlessly, and his next job is to get the suspension set up. There are some upgrades on the to-do list this winter, but we'll cover those in part two of the story in the next issue – where we'll also show the finished car in full. ■

**Don't miss part two in the  
October 2015 issue.  
On sale from Friday 18 September**

**Below:** Final graphics applied, and the car fitted with its windscreen and half hood. More pics next issue!



## Useful contacts

**Kit:** Great British Sports Cars, Newark, Nottinghamshire. T: 01623 860990.  
E: [info@greatbritishsportscars.co.uk](mailto:info@greatbritishsportscars.co.uk) W: [www.greatbritishsportscars.co.uk](http://www.greatbritishsportscars.co.uk)

**Engine management:** Emerald M3D, Thetford, Norfolk. T: 01953 889110.  
E: [sales@emeraldm3d.co.uk](mailto:sales@emeraldm3d.co.uk) W: [www.emeraldm3d.com](http://www.emeraldm3d.com)

**Various:** Car Builder Solutions, Staplehurst, Kent. T: 01580 891309.  
E: [info@carbuildersolutions.com](mailto:info@carbuildersolutions.com) W: [www.carbuildersolutions.com](http://www.carbuildersolutions.com)

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# Win! Six pairs of pliers

In Issue 103, James Horsley put a number of pairs of pliers through their paces for one of our tool tests – and now all of them are available to win by CKC readers!

As ever, James found a range of tools that offer something a little more than the most basic functions, so each of these could well offer something beyond what you already have in your tool kit. Here's what we're giving away:

**Halfords 220mm self-grip long nose pliers (1)** – Mole grip style tool that would typically sell for £8.49.

**Laser 150mm bent-nose pliers (2)** – Bent nose and sprung handles. Usually around £5.

**Laser circlip pliers set (3)** – Interchangeable heads for different size circlips, retails for around £15.

**Draper Knipex 250mm plier wrench (4)** – Part plier, part wrench! Sells for around £60.

**Draper circlip pliers (5)** – Internal and external circlip jaws, around £20.

**Sealey 11in offset needle nose pliers (6)** – Large tool that allows plenty of leverage. Typically £10.

## THE COMPETITION

There will be six winners of this competition. To have a chance of being one of them, just answer the question here. Closing date for entries is Friday 18 September.

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# Vinyl Wrapping

Increasingly popular and affordable, vinyl wrapping is an option more kit car owners are taking up – including our very own John Dickens, who describes the process here.



**A**dhesive backed vinyl film has been used as an alternative to paint in vehicle graphics for many years now, but it is only relatively recently that it has been practical to cover an entire vehicle with a plain or digitally printed continuous vinyl film. This process is known as vinyl wrapping.

## THE MATERIAL

The basic material for a vinyl wrapping film is polyvinyl chloride but other

**“I cannot imagine myself ever painting a car again. The range of finishes, the time saving and the cost means that for me the choice of a vinyl wrap is a no-brainer”**

ingredients, such as plasticisers to make the film flexible, pigments to produce the desired colour, UV absorbers to improve resistance to UV radiation, heat stabilisers, fillers and processing aids, are also added to produce the required properties. There are two methods of producing the thin film (about 120 microns including adhesive) used in vehicle and other graphics.

Cast film is produced by pouring metered amounts of the liquid vinyl mix onto a constantly moving ‘casting sheet’.

This then passes through a series of heating processes which evaporate the solvents to leave a solid vinyl film.

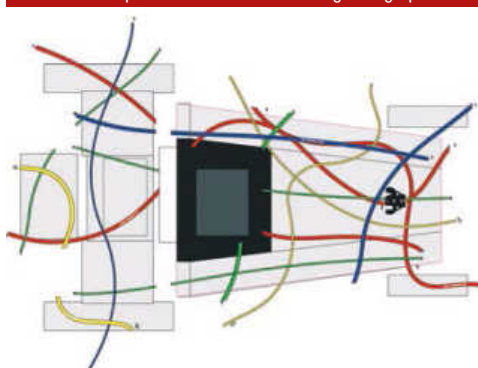
Calandered film is produced by passing the vinyl mix, known as the ‘melt’, through a series of heated rollers until the required film thickness is obtained.

Not surprisingly, these two methods produce vinyl films with different properties and, due to its greater durability, conformability and stability, cast vinyl is preferred for vehicle wrapping.

**Below:** John chose Premier after contacting many firms.



**Below:** Scale plan of car was used to design the graphics.



**Below:** Lights, fittings and rear mudguards were removed.



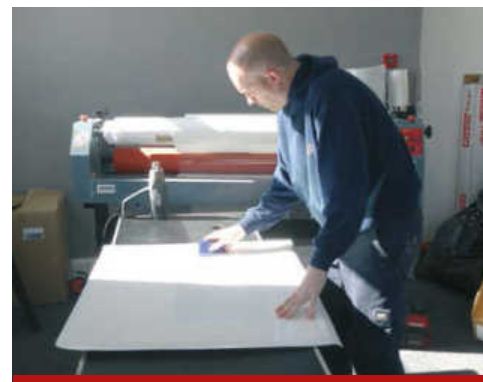




**Above:** Vinyl sheet is cut to size with plenty of overlap.



**Above:** The panel is washed with water then degreased.



**Above:** With backing removed, sheet is pressed into place.

Many companies produce films suitable for vehicle wrapping but the best known names are 3M and Avery. Development of these products is continuous and the latest vinyl films have an 'air release' feature which helps to prevent air bubbles. The adhesive side of the vinyl has continuous air channels which allow any trapped air to be removed during application. Some films also have glass beads in the adhesive layer which prevents it from bonding firmly until pressure is applied. This allows the film to be repositioned a number of times without damage or distortion.

### THE WRAPPING PROCESS

It had always been my intention to have my UVA Fugitive wrapped rather than painted and, although I had been assured by a number of people that it was possible to do the work myself, I had always intended to have it done professionally too. When the car was finally finished, I looked around for a company to do the work. Perhaps I was being naïve, but I imagined that this would be a relatively straightforward process. In fact, of the sixteen companies I originally contacted only two were happy to do the work while allowing me to be present to take notes and photographs. Only one, the company featured here, was professional enough in their preparation and performance to give me the confidence to use them. The rest either ignored me completely, agreed to do

the job and *then* ignored me or wanted to work with their own designs rather than mine.

The company I chose was Premier Graphics and Signs in Durham. The owner, Paul Wadge, has been working with vinyls for over twenty years and has been using them to wrap vehicles since the process began to gain in popularity around ten years ago. Paul initially came to my home to see the car, take measurements and photographs and to talk to me about my proposed design and what was possible with the materials available. In spite of all his experience, Paul had never wrapped directly on to a GRP gelcoat surface before. Sensibly, therefore, before he was prepared to take on the job he wanted to check the adhesion of the chosen vinyl onto the gelcoat surface and he returned a few days later with some samples to test.

In the meantime, I had cleaned and polished all the UVA panels with Farecla G3 to remove any chalking and oxidation as some of the panels were four or five years old by now. After trying a couple of vinyl samples on the panels, Paul was satisfied that the wrap would stick properly and was happy to proceed. The next step was to meet with Tom the designer, at the company's premises, to discuss and finalise the design so that the materials could be ordered and prepared. I had already sent them a photograph of a car with a design I quite liked (a classic Opel touring car) and Tom had created an accurate flat plan of

the car with a design based around this colour scheme.

Initially he had produced a symmetrical design with the majority of the stripes running along the length of the car, but when he realised that I wanted a random arrangement of stripes over the entire car he took a different approach. Rather than striping each panel individually he laid curved stripes over the whole car. My original idea was to have the stripes digitally printed onto white vinyl before wrapping it on to the car but Paul advised against this as, once he began to stretch the vinyl around the more complex curves, the stripes would distort or bend.

The revised plan was to put on a complete single colour wrap then add the stripes and logos afterwards. He also suggested that I might like to look at some of the alternatives to a plain white base colour and showed me a selection of gloss, satin, matt, metallic and pearl finish white vinyl materials. Faced with such a choice, I abandoned my original idea of gloss white and instead chose a pearl white vinyl which has a gold sheen in bright light.

With all the design decisions made, we arranged a date to actually wrap the car. I took the UVA down to the workshop the afternoon before we were due to start and stripped off all the lights, locks and rear mudguards. I also removed the bonnet and engine covers for ease of access. All the loose panels were then taken to the



**Below:** Felt edged squeegee used to avoid marking vinyl.



**Below:** Scalpel used to trim the vinyl flush to the panel edge.



**Below:** Paul also cut the vinyl away from all the fixing holes.





**Above:** Gentle heat allowed vinyl to stretch around curves.



**Above:** A single sheet of vinyl was lowered onto the bonnet.



**Above:** Starting at the centre, Paul worked the vinyl into place.



**Above:** Vinyl can be lifted and repositioned for the best fit.



**Above:** Heating the vinyl allowed Paul to get a perfect fit.



**Above:** Scalpel blades changed regularly for accurate cuts.

office workspace where the light and temperature were ideal.

Paul started with a small flat panel, the engine cover. The vinyl was trimmed roughly to size then the panel surface was cleaned with water then degreased with panel wipe. The backing paper was removed from the vinyl and it was carefully laid onto the panel. Paul then began pressing the vinyl onto the panel using a felt edged squeegee. The soft felt edge prevents the squeegee marking the vinyl surface. Once Paul was happy that the vinyl had stuck properly with no air bubbles he used a scalpel to trim off the excess vinyl.

On a production car, the vinyl would be wrapped over the panel edges onto the returns but on my car there are no returns so the vinyl was simply trimmed flush with the edge of the panel. He also used the scalpel to carefully cut out all the fixing holes so that the vinyl would not lift as the fasteners were pushed through during reassembly. The

scalpel blade was changed frequently to be sure of a clean cut every time. On flat surfaces or single curves heat is not needed but for more complex curves Paul carefully used a hot air gun to soften the vinyl so that it could be shrunk or stretched as required. The vinyl can be lifted and repositioned a number of times to ensure a perfect fit but this particular vinyl had a maximum stretch of 30 per cent and Paul was careful not to exceed this. If the vinyl is overstretched when fitting, it can slowly shrink back leaving voids.

The bonnet was wrapped next. This is the largest panel on the car and I imagined that Paul would probably peel off the backing paper a small section at a time as he smoothed the vinyl down. In fact, he and his assistant Ian simply peeled off all the backing paper at once and, holding the corners of the vinyl, laid the whole sheet onto the bonnet. He then began to carefully squeegee out all the air, lifting and repositioning the

vinyl a number of times before he was happy. Once again, heat was needed around the more complex sections but the final fit was quite remarkable. The rear mudguards are curved in two planes and have a tight radius at the edge, so Paul's initial feeling was that he may have to wrap the vertical sides separately to avoid wrinkles but, once he started working and warming the vinyl, he found that the whole mudguard could be wrapped with a single vinyl sheet. Once again the excess was carefully trimmed away.

When all the removable panels were wrapped, we moved back to the workshop to continue the process on the rest of the car. My plan was that the roof panel should effectively 'disappear' into the chassis frame so that was wrapped in textured carbon fibre. The engine cover sides were done next so that I could refit the mudguards while Paul worked on the rest of the panels. They are larger than they look and have some tricky



**Below:** John chose a textured carbon fibre wrap for the roof.



**Below:** These panels are bigger than they look; quite tricky.



**Below:** Smaller section was needed where curves meet.





**Above:** Complex curve wrapped with separate vinyl patch.



**Above:** Main mudguard section and sides wrapped separately.



**Above:** Huge printer used to print digital images on vinyl sheets.



**Above:** There is no limit to what can be printed!



**Above:** Self-coloured vinyls were used for the stripes on UVA.



**Above:** This machine cuts the graphics from the vinyl sheet.

contours on them so, even with careful heating, it was obvious that they could not be done in one piece. Small patches were used and the seams were hidden out of sight under the car. A similar process was used in the tight corners at the front and rear of the side panels. The seams are hidden on the very edges of the contour changes and are invisible unless you know exactly where to look.

Although the front mudguards look similar to the rears, they are smaller and the edge radius is tighter so Paul did use separate pieces for the inner and outer rims to eliminate the possibility of wrinkles. Once again, the seams are all but invisible. By the time Paul had finished wrapping the remaining panels, I had the rear mudguards in place.

Once the white base wrap was complete the stripes could be applied. Had I chosen a digitally printed design, the pattern, image or graphic would

be digitally printed onto the vinyl sheet then a thin clear vinyl film would be heat laminated over the print to protect it from physical damage and also to minimise the effects of UV light. Depending on the amount of exposure the vehicle gets, digital prints have a life of around seven to eight years. The stripes used on my design were cut from self-coloured vinyl so they have a much longer working life. The machine that cuts the graphics is controlled by the computer used to compile the original design and uses a stylus which can accurately cut through the vinyl layer but leave the backing paper untouched. The waste material is removed leaving the graphics attached to the backing sheet.

The resulting coloured stripes were curved to match the original design, sectioned to allow for panel joins and numbered so that they could be indexed to the design drawing. As Paul applied the stripes we made

some minor alterations to the pattern for ease of fitting but the final result, especially over the bonnet area, was essentially just as it was designed.

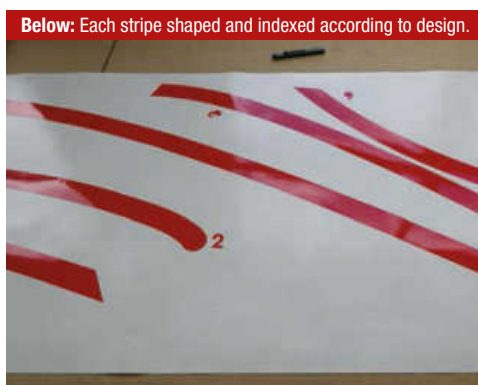
Wherever the stripes crossed, Paul cut away the upper stripe producing a very neat effect (Fig 35). The small 'UVA Fugitive II' logos, some curved and some straight, were cut from white vinyl and added on top of the stripes but another option would have been to cut the logos out of the stripes so that the pearl white wrap would show through.

The only way to enter and leave my car is to slide over the side panels so, to avoid damaging the graphics, a layer of clear 'stone chip protection' vinyl was added here and on the rear wheel arches. This was the only time in the whole process that Paul applied the vinyl onto a wet surface to allow more working time and flexibility.

With the wrap completed, I refitted all the lights and latches to



**Below:** Waste vinyl removed, leaving the cut graphics.



**Below:** Each stripe shaped and indexed according to design.



**Below:** Stripes were cut around the logo and crossing points.





Above: These smaller logos are applied onto the stripes.



Above: Clear 'Stone Chip' vinyl applied over high wear areas.



Above: Inspiration came from an Opel touring car.

complete the rebuild. As always, the refitting of the exterior trim really brought the finish to life and the final result exceeded all my expectations. Personally I think it looks stunning. The cost for the whole process was a very reasonable £845 plus VAT which brought the final total to £1014. I would imagine that an equivalent pearl white paint finish with graphics would cost double this and, in addition to the exterior trim removal, would also involve preparation, masking, drying, curing and polishing. Since I was photographing the process for this article, Premier Graphics cleared their schedule and made a special effort to complete the whole wrap in one working day but two or three days would be typical for a full vehicle wrap.

#### WRAP OR PAINT?

Obviously both finishing systems have their pros and cons and I have outlined the main ones here:

**Preparation.** There is very little difference in the surface preparation required for painting or wrapping. The vinyl film is actually thinner than a combination of primer and paint so any surface imperfections must be corrected before applying the vinyl. If the vehicle is already painted the finish

must be sound. Poor paint finishes may be damaged as the vinyl is lifted and reapplied during the wrapping process.

**Cost.** The cost of a vinyl wrap will depend on the design chosen. A digitally printed wrap will cost more than a single self-coloured vinyl for example but in general wrapping is cheaper than a full respray.

**Options.** Vinyl films are available in a huge range of colours and in gloss, satin, matt, candy, pearl and true metallic finishes. In addition any design you want can be digitally printed onto the vinyl before wrapping. Paint finishes cannot offer this range of options.

**Time.** Some aspects of preparation, such as the removal of the trim and lights, are the same for a wrap or a paint job, but there are some major differences too. With a vinyl wrap there is no masking off, no drying, curing or baking time and no need to buff or polish the final finish. As soon as the wrap is applied the car can be driven away. Typically a full wrap takes two to three days.

**Durability.** Vinyl films are improving in this respect but they are still not as hard or durable as a two-pack paint finish. Exposure to sunlight (UV) will cause the colours to fade but even digital prints should last seven to eight years in normal use.

**Protection.** A vinyl wrap can be used

to protect an original paint finish from degradation and the film can be removed to reveal the original finish if desired.

**Removal.** Vinyl films can be removed and replaced far more easily than respraying the vehicle provided the underlying finish is sound.

#### IN CONCLUSION

In the past, I have always painted my own cars but, over time, this has become more problematic, first with the introduction of two-pack polyurethanes then later with water based coatings. As a result, I was curious to see the wrapping process first hand and, although this has been my first experience of the process, I have to say that I am already a convert. I cannot imagine myself ever painting a car again. The range of finishes available, the time saving and the cost means that for me the choice of a vinyl wrap is a no-brainer. ■

#### Contact

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W: [www.premiergraphicsandsigns.co.uk](http://www.premiergraphicsandsigns.co.uk)



Below: Refitting all the exterior trim really brings out the finish.



Below: The roof panel effectively 'disappears' with the carbon wrap.





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# Our Cars

John Dickens takes the UVA Fugitive to a Volkswagen show (and finds that, not only is his the only kit car present, but also that nobody there has even heard of UVA) while James Horsley makes progress on the Nova now that his buggy has been put away in storage.



**John Dickens**

**PROJECT**

UVA Fugitive

**THIS MONTH**

Some minor tweaking and a trip to a Volkswagen show for the Fugitive this month.



The annual family holiday was first on the agenda this month – a caravan in Filey for a week with the grandchildren. The day after we got back, there was the Volkspower show in Redcar. I really wanted to get to this as I felt that any car show in the North East should have as much support as possible and I also wanted to see how a VW-specific show was organised. I gave the UVA a quick check-over and the oil and tyres were fine but the alternator belt had slackened off slightly so I made a mental note to adjust that when I had a spare moment.

The drive to the show was uneventful although, as I first noticed on the run down to Stoneleigh, the top speed is limited to around 66mph as the front mudguards start to oscillate above this. It's obviously an aerodynamic effect. I'll have to do some research to see what happens if I push on through the vibration patch.

The show itself was very good with

a huge turn out of mostly local vehicles. My UVA was the only Beetle based kit car there unless you count the Baha Bug which I think was a Wizard of Rods conversion. There was a Banham Spyder 550 kit which is Skoda based but all the rest were standard or customised VW products. Some of the cars were very impressive and the guys with the vans and buses really know how to travel. The UVA generated a lot of interest but, surprisingly at a VW

specific show, nobody knew what it was or had even heard of the marque. Incidentally, there was an admission fee for everyone, regardless of what they were driving.

A couple of days later, I decided to adjust the alternator belt. The adjustment system on the Beetle is rather unusual as the cooling fan is mounted on an extension of the alternator shaft and the fan is a close tolerance fit in the fan housing. This means that the

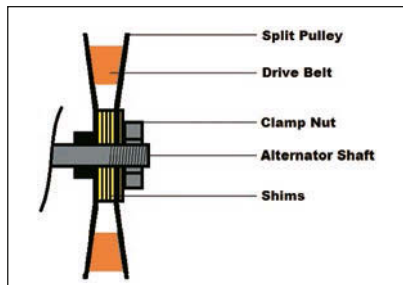
**Below:** Banham 550 a Skoda-based interloper.



**Below:** Nicely finished Baja Bug.







**Above:** Alternator belt adjustment using shims in a split pulley.

alternator has to be rigidly mounted and non-adjustable. Instead, the alternator pulley is split into two flanges separated by shims. Removing shims allows the two flanges to sit closer together, forcing the belt to ride higher in the pulley increasing



**Above:** The allen key jams the rotor (but avoids the windings).

its tension. Adding shims has the opposite effect. Spare shims are stored behind the fixing nut so that they don't go missing.

It sounds like a bit of a chore but, once you have found a suitable way of



**Above:** Rotating the crank pulley stops the belt being trapped.

locking the alternator shaft, it is actually quite simple. You have to remember to keep rotating the crank as you tighten the pulley nut though or the belt gets trapped between the pulley flanges as they close.



## James Horsley

### PROJECTS

Apal buggy and Nova

### THIS MONTH

James gives fibreglassing a go for the first time.

**A**s shown in my update last month, the garage was getting somewhat congested. So firstly a thank you to Alison for the loan of her outbuilding to house the buggy. With the buggy out of the way I have been able to focus on all things Nova. My priority having received the shell back from Westgate Composites was to get it mounted on my newly refurbished chassis. Initial test fittings (thank you Dave, Simon and Brad for lifting duties) confirmed a few areas I needed to focus on.

On previous Novas, I have never been happy with the fuel tank fitment. The kit was designed to take a Beetle tank over the gearbox. The fuel outlet pipe ends up very close to the gearbox, and I have also found the starter motor wiring to end up very close also – raising a risk of shorting out. I made the decision to raise the tank supports and move the tank forwards toward the cabin rear bulkhead. This also gave the positive side effect of making the fuel sender more easily accessed through the rear window tunnel!

Unlike Mr Stent a couple of issues ago, I avoided going for my trusty materials of choice (steel/aluminium and a rivet gun) and decided to give fibreglassing a go. Nothing to John Dickens' standards, but I did manage to fabricate a right-angle profile, and glass this into the shell for the front fuel tank support. I chose not to glass in another support as this would lock the tank in permanently. So the rear support was made up in steel. This cross bar will also serve as an earthing point in the engine bay, and can be raised or lowered to ensure the tank is level once the final ride height is set.

Having 'enjoyed' my fibreglass work, I turned my attention to the tub fitment. The Nova shell mounts to the Beetle chassis lip through around 20 holes. The quality of pattern replacement floorpans

can vary greatly, so I couldn't be certain that the holes on the shell were drilled in the correct place, but pleasingly I found the majority to line up well. Only

two needed moving slightly which was a great result for a 40-year-old shell. One area on the shell that doesn't line up so well is the rear corners. The Beetle pans



**Above:** Template for chassis/body in-fill panel made in fibreglass, but fuel tank brackets (below) came first.



**Above:** Tank support bracket prepared.  
**Below:** Fuel filler fitted and tank visible...



**Above:** Tank support glassed in.  
**Below:** ...but hidden once rear window tunnel fitted.





**"I avoided going for my trusty materials of choice (steel/aluminium and a rivet gun) and decided to give fibreglassing a go"**



**Above:** Body mounting bolts with square plates to help spread the load.



**Above:** Rear corner of the body tub didn't line up with chassis.



**Above:** New profile, as shown on previous page, glassed in and ready to be bolted down.



**Above:** James is over 6ft, so driver's seat needs to adjust as far back as possible.



**Above:** Nova literature sent in by reader Derek Ring.

are very square, but the Nova is curved, leaving a small area that needs filling between the shell and chassis.

Previous Novas I have stripped have had this made up with additional rubber, expanding foam, sticky mastic, and even newspaper! Needless to say, I wanted a better solution so I made a template out of card to match the tub profile. This was then laid up in fibreglass ahead of test fitting and additional layers being glassed on. Once happy, I keyed up the tub side with a grinding wheel and glassed it into place, incorporating a bolt hole to mate up to the final fixing points on the chassis. The tub was then bolted in place with stainless bolts and captive washers. With the tub locked in place I could test out seating positions and bolt

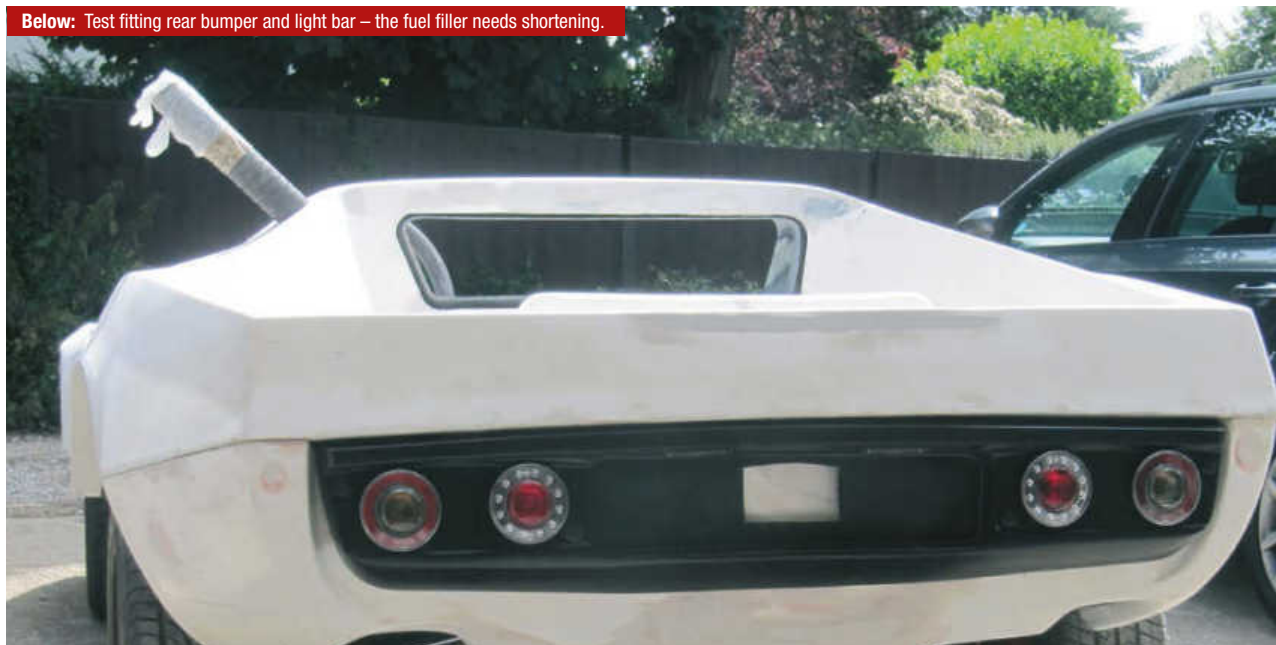
down the seats (Mazda MX-5 items). Runners needed fitting to allow me and my long legs to drive with adjustment possible for my wife Sarah.

Suddenly it looks very different. A bit more fibreglassing was needed on the tub to fill the fuel tank filler hole lovingly created by Andy Westgate. The other side-effect of moving the tank upwards was having to relocate the filler neck. Again, this has yielded a good result, as the filler is higher, and more direct to the tank inlet itself. Previous Nova filler arrangements have required a gentle trigger finger at the petrol station – this set-up should be more user-friendly. My focus for the month ahead is the fitment of the dashboard, rear bumper and hydraulic reservoirs. I aim to get some

paint onto the tub by early September so I need to know everything fits well before then.

A quick thank you goes to reader Derek Ring who sent in some early Nova literature including a build manual and associated letters, one apologising regarding a price rise of the full kit to £2000 in 1980! And finally please forgive a small abuse of the feature for a get well soon message. I wouldn't be writing this feature, or tinkering about with cars, if it wasn't for my dad's infectious enthusiasm for classics, and his support in helping me find an interesting car (a Beetle, of course) for my first car aged 17. Keep up the exercises dad, good to have you home – we will be at a car meet together soon. ■

**Below:** Test fitting rear bumper and light bar – the fuel filler needs shortening.





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# Kit Tips

CKC contributor, Martin Scott, reveals often simple, cost-effective but highly effective workshop hints and tips to make your life easier in the garage.

## Making a replacement badge

**W**hat do you do when the manufacturer of your kit car is long since gone and you need a replacement part that is no longer available?

That's the situation I was in when the bonnet badge of my Rickman Ranger was damaged. Short of hoping that one might become available on eBay or via the owners' club, there was only one other solution – to make a new one using the old, broken one as a template. In pictorial form, here's how I did it...

**Below:** Oops, someone's bumped the Rickman?



**Below:** Use dental floss to gently overcome adhesive.



**Below:** Lots of repair needed.



**Below:** Pieces positioned on board using double-sided tape.



**Below:** Resin added to 'first level' of badge, and into cracks.



**Below:** Trimmed with blade.



**Below:** Plasticine used on good part of 'M' to..



**Below:** ...make a mould to use on damaged part.



**Below:** And filled with resin up to 'second level' to repair 'M'.



**Below:** Plasticine barrier added to board to make female mould...





**Below:** ...using wax and gelcoat before...



**Below:** ...resin, tissue and two layers of 190gsm mat to give...



**Below:** ...the female mould...



**Below:** ...flex slightly to release and we have...



**Below:** ...female mould ready for waxing, followed by black gelcoat, resin, tissue and matting...



**Below:** ...to make our new badge, which requires trimming and cleaning.



**Below:** Martin used three coats of Humbrol 'gold' enamel applied with a small brush once wax was removed.



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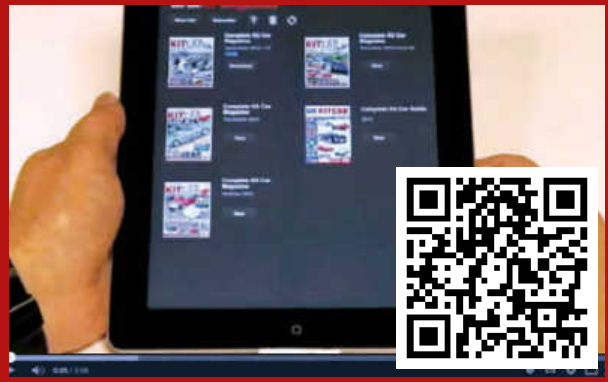
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# Running Reports

The latest updates from our team of Running Reporters, building their cars at home. Are you inspired to get into the garage?



## Vivienne Lodge

**PROJECT**  
Westfield SE

**AGE**  
56

**OCCUPATION**  
Retired driving instructor

**PROJECT START**  
March 2015

The next job on my Westfield build, fitting the driveshafts, looked to be straightforward. Hmm... They are quite heavy, so with help from my partner we secured the driveshaft to the differential using thread lock on the bolts. The difficulty came when we tried to tighten the cap screws, as the driveshaft kept turning. We couldn't grip them enough to reach the required torque. Time to accost the daughter's fit and strong boyfriend. So, with the combination of a bit of muscle and my partner, we managed to hold the driveshafts still, whilst I tackled the torquing. Lots of huffing and puffing later, result. I tied up the driveshafts with bungee cords so they were supported and out of the way for the time being.

The fitting of the rear wishbones seemed pretty easy and I managed to fit them OK and relatively quickly, incorporating the fuel tank frame in the process. Fitting the rose joints wasn't so easy. One of them threaded in fine, the other three were too tight. The build manual suggests running a half-inch tap to clear the thread. A what? Gibberish again!

Back to my trusty friend Google to learn about 'tap and die'. These were not in my tool kit and when I went to buy a set they are all metric. I tried a 12mm tap but this didn't work. Did I need a 13mm one? I was now worried I might damage the thread on the wishbone. After searching everywhere, I managed to buy a half-inch tap and succeeded in getting the rosejoint into the wishbones. Looking good.

It was when I came to fit the rear uprights that I discovered that I wasn't such a smart arse after all! Did I foolishly say the wishbones were straightforward? Easy, even? When I came to lift and attach the uprights, the rosejoints didn't line up underneath each other. Fortunately, I realised I had fixed the left wishbone on the right side and the right on the left. Never mind, I soon had them swapped round. I also had to sand down the long shafts so they would fit through the wishbones without sticking. Getting the washers in the right order, lifting and holding the uprights and fitting the washers proved a bit of a challenge. The washers kept dropping on the floor where I couldn't reach them.

A shout for help to my daughter revising in the garden worked a treat.



Above: Rear wishbones went on easily.



Above and below: Wishbones right way round!

Lesson learnt here is to hold spares in your teeth! I had to phone my trusty friend at Westfield (more than once) as I couldn't find nor identify the reducing sleeves needed for the rosejoints. To be honest, I hadn't got a clue what they were! This is where I wish ominous bags of nuts and alien looking 'things' were labelled.

The left upright was on in no time. The right proved a pain and I wonder if the shaft was still a bit tight. I didn't force it, honest gov! Just a couple of blasts with a mallet and that seemed to do the trick. Also the reducing sleeve kept moving out, so I used a drift and a hammer to edge it gently back into the rosejoint. Finally, it was time to attach the driveshafts to the uprights, using thread lock on the bolts. Once torqued,



I marked with a felt pen to show they had been torqued correctly and this also lets me check that the bolts haven't moved later on.

The suspension units were fixed onto the uprights and, with a C-spanner, I set the rear shock absorbers by winding up the spring adjuster ring. I'm looking forward to fitting the fuel ancillaries and tank next.

Below: Differential fitted earlier, so driveshafts, uprights and brakes were on the agenda this time.



## Next issue

**JOHN CLEMENTS**  
Tiger Supercat

**ANDY GREEN**  
Healy Enigma

**IAN JACKSON**  
GKD Legend

**ROSS MAYNARD**  
Tiger Super Six

**ED MORTON**  
Nova

**JON PAGE**  
GBS Zero

**JAMES SHIPPERLEY**  
DDR Miami GT





## Tom Hyland

### PROJECT

Raw Striker

### AGE

41

### OCCUPATION

Software development manager

### PROJECT START

January 2012

Progress has been slow over the past few months, with time in the garage disappointingly low. I have, however, resolved the front brake situation.

You may remember that I had an offset problem with the front Wilwood calipers not lining up properly with the discs. This could have been caused by any number of things, including incorrect brake caliper mounting brackets, wrong hubs or badly fitted wheel bearings, brake discs with the wrong offset, or the uprights not being the ones I thought I had purchased. Of course, there was also the real possibility that I had put all of the correct parts together incorrectly!

Given the number of variables, I decided the quickest course of action would be to take all of the items down to Rally Design (the suppliers of the brake kit) and let them decide what was wrong. After removing the front offside upright, I loaded everything into the car and set off to Kent on a Wednesday morning. I arrived at Rally Design with a big box of bits and within 10 minutes the problem was resolved – the mounting bracket was a few millimetres too thick (see the picture). This was enough to cause all of my woes and, after the correct brackets were used, everything went together just fine.

Rally Design had not had this reported before, and so we came to the conclusion that I must have collected a rogue bracket set at the Stoneleigh show. They replaced the brackets for free with no quibbles, which I was pleased with given that I had purchased the kit more than three years ago and had lost proof of



Above: Spot the difference! With correct bracket...

purchase. Upon returning home that afternoon, I refitted the upright, and then fitted the brakes and hubs, with everything lining up correctly. This in turn meant that I could fit all four wheels, so now I have a rolling chassis – a milestone reached!

The overall plan now is to get the engine in, and then get the suspension roughly set up with all the heavy items in the car, including me. This means that I can fit the bodywork confident that it will all line up when I have the suspension fine-tuned after the build is complete. So I am finishing off the petrol tank fitting at the moment, including all of the front to rear



Above: ...the brakes could finally be fitted.

pipework, and I am waiting for a few nuts, bolts and brackets to arrive in the post to complete that task.

Below: Car is now on all four wheels. The next big milestone planned is fitment of the engine.



## Jason Burrage

### PROJECT

DeHavilland DVT GTS V6

### AGE

44

### OCCUPATION

Project manager

### PROJECT START

November 2014

Every time it comes to writing my Running Report, I think to myself "I don't have much to say this month as I haven't made much progress." That is until I read through my previous report to see where I was up to. Having built two kit cars previously, I know it's easy to feel progress is slow at times, especially when doing all the small, niggly jobs. Spending a little time writing these reports is proving good for my motivation as it makes me realise just how much I have done.

Anyway, today the twins turn nine months. Amelia is fully mobile on all fours and now trying to stand all the

time. Samuel is kind of crawling too, but seems more stable when he's trying to stand. They're also getting more inquisitive, which means shiny new car parts are as interesting as their toys. Amelia examines them carefully with her fingers, whereas Samuel just tries to hit them with his plastic hammer. The foundations of a good kit car building team when they get older perhaps?

So, on to the build. Things were delayed a little as I had some block paving to do in the garden and then spent a week boarding out the roof space in our garage with stairs going up to create an easily-accessible space. All

the donor parts and new parts are up there out of harm's way, so I now have a clear, tidy garage with loads of space to work. It makes a change to not be constantly stepping over piles of parts and tools.

With the rebuilt engine and upgraded gearbox sitting in the subframe, I had to work out how best to prevent the offside driveshaft being too close to the exhaust manifold. The only solution was to utilise the MG ZS 180 intermediate driveshaft, which is a fixed shaft that extends from the differential housing to a bearing that bolts to the engine block. On the end

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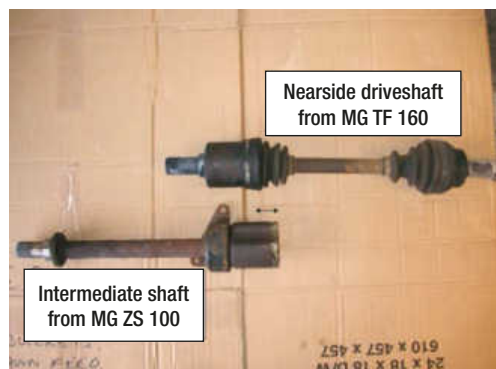
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**Above:** Modified driveshaft to prevent it being close to exhaust.



**Above:** Dynaliner on bulkhead just one noise-absorbing measure.



**Above:** Cockpit side of bulkhead bonded and riveted in place.

of the shaft is a tripod joint which acts as the inner joint for the driveshaft to the hub. I had a lengthy conversation with CPS Driveline about the best way to get this all to work. We decided to keep the MG ZS intermediate shaft as-is and, using a nearside MG TF driveshaft and some measurements I sent them, they mocked up a dummy driveshaft to go to the wheel. The first attempt was 20mm too short so the final item was made to the correct length. When it arrived, it fitted perfectly.

In the meantime, I'd been doing more prep in the engine bay. First job was the fuel tanks. I ordered these in aluminium and they came with straight barb fittings for the hoses. I prefer braided aerospace style hoses, so cut off the barbs and welded on some 6AN male fittings for inlet and return. With two tanks in the car, they require a breather hose between them, so 8AN male fittings were welded on for that. Finally, I welded on an earth point as the tanks will be sitting on Dynaliner foam and held in place with steel straps lined with neoprene, which will insulate them from the chassis. My TIG welding skills are definitely improving

with some rather professional looking welds on occasions. Even the less tidy welds are proving more than functional, which is pleasing.

Before fitting anything permanently in the engine bay, I decided to get all the soundproofing in place. There are three ways to avoid unwanted sound.

1) Prevent it. 2) Block it out. 3) Absorb it. I've opted to do all three.

1) I fitted a layer of self-adhesive flashing tape on the passenger side of the aluminium bulkhead, which is heavy and dense so should reduce panel vibration.

2) A layer of 6mm self-adhesive closed cell foam went on top of that, followed by 1in of reconstituted foam and 1/4in soundproofing felt from Martrim, both glued in place. I then encapsulated it all with a fibreglass panel bonded and riveted in place on the chassis members. Now when I tap on the panels I get a dull thud, so hopefully this lot will be quite effective.

3) Inside the engine bay, I've covered the bulkhead in 1/2in thick Dynaliner. This stuff is amazing at absorbing sound and the adhesive backing keeps it in place, even in hot engine bays. I've

used it under the hood of my Cobra replica and it cut the engine noise down dramatically. All the nooks and crannies around the chassis members and bodywork were also filled with pieces of self-adhesive closed cell foam and then covered in Dynaliner. I don't want any areas where engine noise has a clear path into the cabin. With everything covered, this should absorb much of the sound before it has a chance to transmit into the cabin. Anything left should be attenuated nicely by the soundproofing.

Further soundproofing and absorption layers will go into the cockpit when it gets trimmed. This isn't a race car, so a few kilos of soundproofing is perfectly acceptable and will help in terms of driver and passenger comfort.

With that lot in place, the main brake pipe to the rear was fitted, as were the fuel pipes that run across the bulkhead. Finally, the insides of the fibreglass rear wings were given a coat of polyurethane rubber sealant, as were any exposed chassis members to prevent stones chipping the chassis paint.

I then reached a major milestone for the build – fitting the complete rear

**Below:** No room in subframe for oil filter, so a remote one was fitted.



**Below:** New hoses to the relocated oil cooler.



**"I don't want any areas where engine noise has a clear path into the cabin. This isn't a race car, so a few kilos of soundproofing is perfectly acceptable"**

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subframe, engine and gearbox. I'm just hoping I haven't missed anything and therefore don't have to take it out again!

On went the suspension, hubs and brakes, which allowed me to complete the rear brake pipe runs and fit hoses to the calipers. Next up were the handbrake cables and gearshift cables.

I'm currently busy trying to work out

all the coolant pipes in the engine bay. I've done the major ones and fitted an air bleed at the highest point that'll go to the expansion tank, but still need to fit the smaller heater hoses and expansion tank.

Next on the list of tasks is to fit the doors and door locks so I can bolt the door latches in place. This requires the

fuel tanks to be removed, so I want to get it done before finishing the fuel system. The passenger door lock and striker are in place, which didn't take long as I hung the door several months ago. The driver's side will be more time-consuming as I have to set the hinges in the correct place, hang the door and then fit the lock.



## Chris Haysom

**PROJECT**  
RoadRunner SR2

**AGE**  
45

**OCCUPATION**  
Charitable trust

**PROJECT START**  
January 2014

**H**ow true, I said to myself reading Ed Morton's comments about the mysteries of missing tools. I'll put something down, turn around and it appears to have gone – more than likely just disappeared in a pile of stuff on the bench. I must clean up more often!

Various non-car commitments have conspired to keep me out of the garage for a while, what with three weekends away in Yorkshire and other excuses to boot. However, I can report that the driveshafts and rear hubs are all in. I cobbled together a tool for pulling the hubs square onto the driveshafts using a long bolt, various washers and a spacer that came from somewhere off the donor (not sure what it was but it did the job).

I have secured the fuel tank in position and attached the flow and return hoses. You may remember that some time ago I created a bracket to hold the fuel pipe connections in place. Well this works fine but is a faff to get on and off so I have decided that if it ever needs to be removed because of a fault I shall get a second-hand Mk1 pump and sender unit and use that as it has nice simple pipe attachments. For now I am hoping my set-up will never need to be removed!

My trip up to RoadRunner during our holiday resulted in collecting several items including a nice modified shallow sump, which compared to my original donor one is a huge difference and a Mk1 exhaust manifold. Many SR2s use this exhaust manifold which is a 4-into-1 set-up. My later Mk2 donor has a 4-into-2-into-1 design so I swapped my Mk2 manifold for a Mk1 version so all the parts fit. Mike is going to fit a boss in the link pipe to allow the lambda sensor to be installed as this is normally screwed in to the longer Mk2 manifold – confused?

Other purchases include a nice set of grooved and dimpled brake discs and some rear brake calipers, plus a new set of handbrake cables. These have been attached to the compensator mechanism and the handbrake bolted into position. The ends of the handbrake cables have been left loose for now, but will be attached when I fit the calipers which are currently residing in the dry of the house as I did not want them to corrode and seize in the damp garage



**Above:** Driveshafts and rear hubs now assembled and fitted to Chris's RoadRunner.



**Above:** Tool for pulling hubs square onto driveshafts.



**Above:** New discs ready to go on.

before I got to use them in anger.

I have started checking over the electrics and, as I was working at the rear of the car, I thought I might as well start work on the rear section of the donor loom. When I removed the hideous multi-coloured spaghetti from the Mazda I labelled everything as I removed it. That was much slower than just ripping it all out but it paid dividends when checking what was what. I have now refined this by labelling each wire near a connector so when I cut off the old plug or socket it's easy to see what each wire does. At present all I have done is lay this small rear loom section on the tank while I work out which is the best route for each circuit.

I have a corner of the garage that

is gradually filling up with the circuits I have removed from all the loom sections. I think by the time I remove the rope-like ABS circuit over half the loom will be have been removed. Electrics commonly seem to cause panic among many builders and, whilst I'm no expert at this, as long as you take your time and – critically – label everything, check and double-check you should be fine. I still seem to end up scratching my head at times!

My 1800cc engine has been sitting on its engine stand since it was removed and, apart from rotating it to remove the sump, that's as far as I've got. I'm still unsure how much work to do on it at the moment, but that can wait for another time.



**Below:** Standard sump exchanged for...



**Below:** ...shallow sump for better clearance.





## Rob Davenhall

### PROJECT

Midtec Spyder

### AGE

37

### OCCUPATION

Specification manager

### PROJECT START

April 2014

The Midtec build hasn't seen much action over the last six weeks. Holidays, decorating and the preparation for my *Top Gear* inspired road trip around Europe has taken all my spare time of late. I think after the last few months the wife was glad to have me back, for a while at least.

I did finally get one thing ticked off my bucket list though and had a wonderful family holiday to Cornwall to visit the Eden project, which I would recommend to anyone. I've been all round the world but never to Cornwall. It's beautiful and has some great driving roads, would definitely return with the Midtec one day.

Another thing I have always wanted to do was a road trip around Europe. I lived in Italy for a few years in my early 20s and really fancied going back, lads style! By the time

you read this, I will have visited the Nürburgring, Monza, Magny-Cours, Le Mans and been down many a mountain pass, the best known being the Stelvio Pass, on a 2000-mile lads road trip. There are six cars in total so should be a good giggle.

I hear you all thinking, well what's he driving? Surely not the Midtec! And you'd be right, I'm not that brave yet! I was supposed to be going in my Audi TT but, after a recent track day to test it, I have blown the turbo and I'm struggling to get it fixed in time. I'm not having much luck with engines at the moment but at least it didn't happen mid trip. So we have had to source a car quickly which turned out to be a BMW 3-series with a few extras. It's not my first choice but it should do the trick and the air-con works!



Above: Failed Audi TT continues Rob's bad luck.

Sorry this edition isn't much about the Midtec build but I promise the next one will be more fruitful as the engine is off to be rebuilt! I thought it maybe better to get it rebuilt rather than risk using another 12-year old engine just for that to go pop. If you want to see my road trip antics or follow the build of the Midtec build, you can catch up at my Twitter page – @robertdavenhall



## Stuart Bruce-Jones

### PROJECT

AGM WLR

### AGE

30

### OCCUPATION

Aerospace project manager

### PROJECT START

August 2010

The past couple of months have finally seen fabrication of the roll cage.... Well 85 per cent of it! Delays and equipment failure aside, it has not been an easy task for the fabricators and they have had a few attempts to get it not only strong and fit for purpose but looking right.

At this point, it's worth mentioning that the cage can be unbolted as it has been quite cleverly designed to mount to purpose-built platforms underneath the bodywork. The roll cage fabricators have recently recommended adding additional 'doors bars' (not shown in pictures) and consequently the reduced access would mean climbing in and out of the car in a *Dukes of Hazzard* fashion, obviously yelling "yeeee haaaww" as I go. Although I have said yes to the additional bracing,

I can foresee this wearing a little thin after a while and using the cage just for track days.

As with all things on this car, progress takes two steps forwards and one step back. This month's drama has been during the placement of the roll cage. It quickly became evident that the brace for the two forward pillars would either require placing above the dash, which would result in my visibility being extremely impaired, or would require the fabrication of a new dashboard and transmission panel.

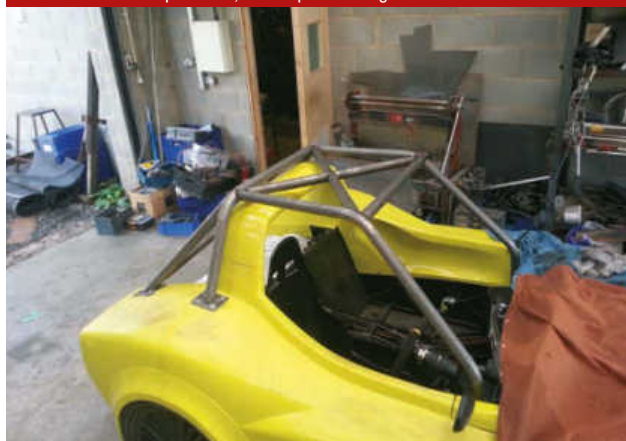
In the end, the choice was an easy one. The cage (which is millimetre perfect for safety) highlighted that the dashboard element of the chassis isn't symmetrical, and neither is the body. This is why I have had issues in getting a good fit with not only the cage but with

some of the interior fibreglass panels, such as the tunnel cover and dash. I've starting crafting ones that can accept the cage and will also be in keeping with the car.

The rear spoiler element has been designed and fabricated but it hasn't yet been mounted. If you have seen an LMP Le Mans car, you will appreciate the difference in style of the rear wing that I am going for. The current one is a little too *Fast and Furious* for my taste. More on this next time.

Next month should be entertaining, with the completion of the cage and rear wing. I should also see the car having a specialist Megasquirt engineer on site to ensure we are running correctly and provide the car with a more substantial map and tune. ■

Below: After a few problems, the bespoke rollcage is now fitted.



Below: Addition of cage has led to some modifications to the GRP panels.



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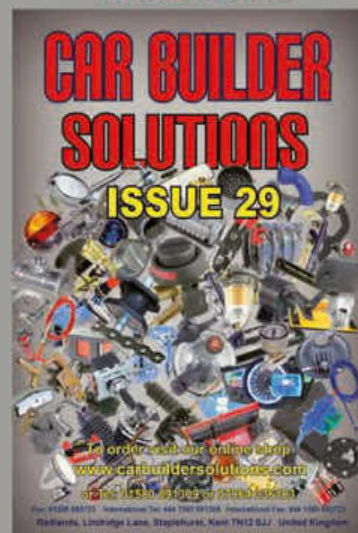
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## Gottle of geer, anyone?

We like the look of (but have yet to taste) these bottles of bitter which are branded with Prescott Hillclimb themes. Developed by the nearby Prescott Brewery, the three different ales are called, Grand Prix, Chequered Flag and Track Record.

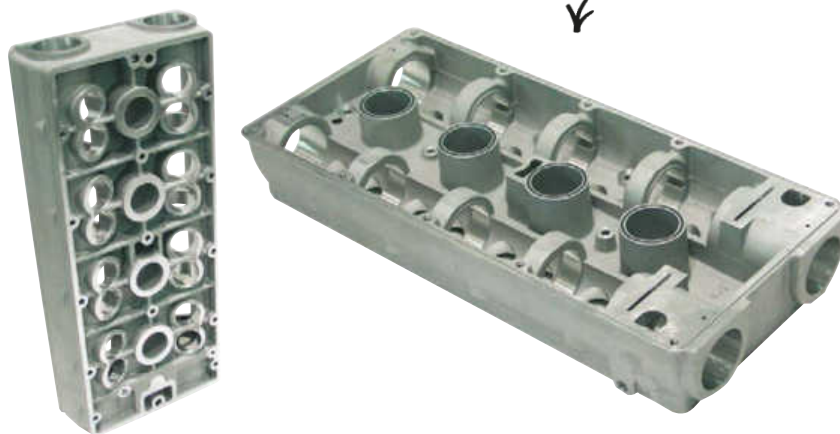
Price: £20 inclusive VAT.  
W: [www.meandmycar.co.uk](http://www.meandmycar.co.uk)



## Up-rated Cossie cam carriers

If you are rebuilding a Cosworth engine, then you might want to consider Burton Power's new up-rated cam carriers for the BDT, BDA and BDG engines. Made from LM25 castings which are then CNC machined, they now include refined strengthening in critical areas, burnished tappet bores and O-ring sealed top cover face. Included in the kit are the sealing kit and core plugs.

Price: £599 inclusive VAT.  
W: [www.burtonpower.com](http://www.burtonpower.com)



## Affordable cordless drill

Rally Design seems to be continually digging out extremely affordable tools and parts suitable for the kit car enthusiast. Latest are a number of powered tools within the Blackline range which include cordless impact wrench (£79.79), screwdriver (£23.35) and the drill shown below. Mains driven tools include a 11,000rpm angle grinder (£27.60), speed controlled polisher (£47.84) and 2kw hi-flow heat gun (£29.96). All prices above are plus VAT.

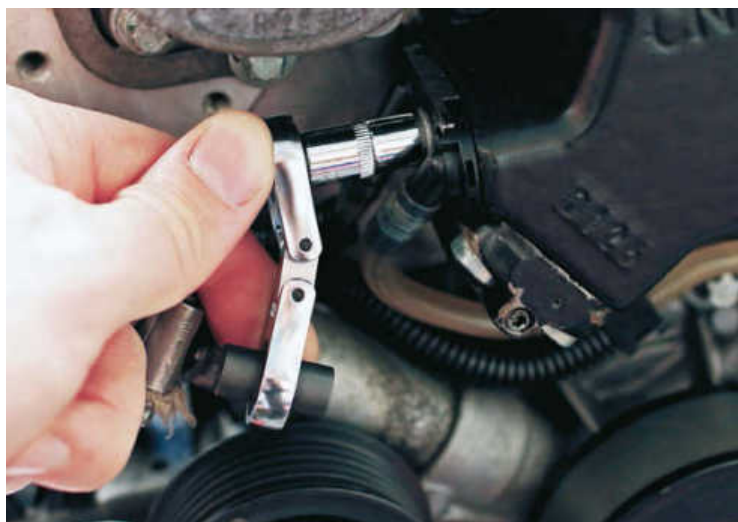
Price: £59.76 inclusive VAT.  
W: [www.rallydesign.co.uk](http://www.rallydesign.co.uk)



## Pocket size ratchet

We're big fans of little tools... things that will easily fit into the tight confines of a typical kit car cockpit! So this tiny 70mm long flexible 1/4in drive ratchet (6074) is perfect. Not only does it have the drive for a standard socket, but at the other end is a magnetic hex bit driver.

Price: £23.40 inclusive VAT.  
Contact: W: [www.lasertools.co.uk](http://www.lasertools.co.uk)





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# 3D Printing

3D printing is coming to the kit car scene – it's just a matter of when and to what extent. Will it transform the way kit cars are built and manufactured? Chris Pickering takes a detailed look at the technology and speaks to those who are already using the technique.



**A**t times it can feel like the future is racing towards us at an ever-increasing pace. A decade ago, the thought of streaming programmes straight to your TV from the internet seemed futuristic; now you can do that while conducting a video call on your voice-activated smart watch. It's all starting to sound a bit like *Back To The Future*. Last month Lexus even made a working hoverboard!

When it comes to kit cars, one of the most intriguing prospects of this Brave New World has to be 3D printing. If you believe the hype, we could one day be able to print major components

**“The beauty of 3D printing is that it allows anyone with a decent grasp of CAD to make parts that would otherwise require a highly skilled fabricator”**

or even whole cars at the touch of a button. Wake up one morning bored with the roadster body on your car? No problem. Print a closed-top coupé skin for it over breakfast and it'll be ready to bolt on by the time you've finished your Corn Flakes.

The reality is very different – at least for the time being – but there are already practical and compelling uses for 3D printing.

The term covers more than a dozen basic types of process, which vary dramatically in method and materials. By far the most common is fused deposition modelling (FDM), which also happens to be the most literal usage of

the term 3D printing: if you imagine a conventional desktop printer whizzing over the page, depositing a layer of ink, FDM works in much the same way, except it lays down materials like Nylon or ABS. Each time the printer goes over a spot, it puts down another layer, gradually building up the component slice-by-slice.

Traditionally this method was confined to initial concept studies, but as the materials have become stronger and more durable it has spread to fully-functioning prototypes and even production parts.

“The era of 3D printing has arrived, and it really interests us,” comments

**Below:** Local Motors 3D printed its Strati live at show...



**Below:** ...using a BAAM machine.



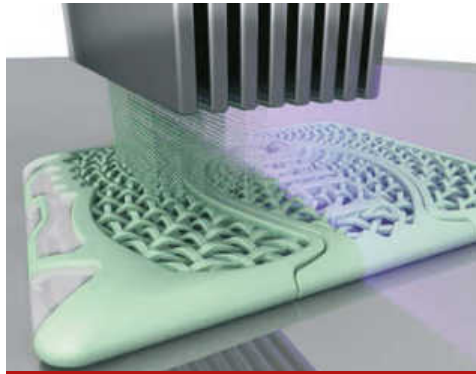
**Below:** Local Motors prints parts for its kit-form Rally Fighter.



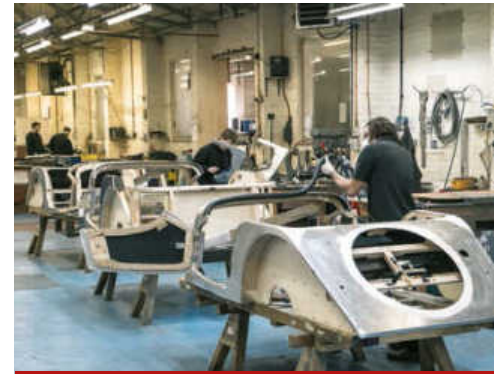




**Above:** 3D printed injection mould for a diaphragm being removed from a printer.



**Above:** Most common 3D printing systems work by depositing layers of semi-molten material – a bit like inkjet printers.



**Above:** Morgan has streamlined its production by using 3D printing alongside its more traditional methods.

Caterham's engineering development manager, George Campbell. "We already use 3D printing to some degree, but it's restricted to tooling, part validation and packaging sign-off processes for the time being."

However, it might not be long before things change. "There is scope in the future to adopt 3D printed parts in production models," he adds. "This could reduce tooling costs even further and leaves the design more flexible, but we are currently undertaking an analysis of the feasibility of such a step."

Meanwhile, over in deepest Worcestershire, another low-volume car manufacturer has been embracing this technology. Morgan may not sell its car as kits, but the challenges it faces are not that different.

"3D printing has a lot of benefits for small companies like us," comments Morgan's head of design, Jon Wells. "We don't have the same budget as the big car companies to keep making prototypes, but with this technology you can test ideas out almost in real-time."

Morgan uses a Stratasys Fortus 250mc printer to produce prototype parts in ABS. Some of these are used by the design team to evaluate packaging and ergonomics, while

others are used as castings patterns. Some even make it onto the finished cars, although not currently for regular production models.

When the new Aero 8 made its debut at the Geneva Motor Show in March, it was still several months away from production, so the team had to use 3D printing for various parts, including the switch panel on the centre of the dashboard. Prior to that, the one-off Morgan SP1 used the same technique for its switch gear, badging and wing mirrors.

"3D printing has got huge potential for customisation. It enables us to produce new designs very quickly and reduces the tooling costs upfront," says Wells. This hasn't gone unnoticed in the kit car industry either, where it raises the prospect of manufacturers being freed from the use of off-the-shelf components or donor parts. Little things like bespoke instrument pods or air vents can help the car to stand out, especially if a customer wants something made to order.

Over in the States, Local Motors has taken the idea a step further. Most 3D printers struggle to cope with anything much bigger than a shoebox, but last year it used one of a growing number of Big Area Additive Manufacturing

(BAAM) machines to print the entire body and chassis of a car called the Strati. This was done largely to show what could be achieved, but the company also prints smaller items for its Rally Fighter kit car, including spacers to adapt the Dodge Challenger wing mirrors to the complex shape of its door skins.

Where things get really interesting, however, is a family of techniques known as laser sintering. These use a laser to fuse together loose grains of powder into a solid structure and they work on a number of materials, including – most importantly – metals. For years now, Formula 1 teams have been using this technique to produce fully functioning exhaust parts in titanium and Inconel. These are every bit as strong as a conventional fabricated part, but they can be made substantially lighter.

Elsewhere, Koenigsegg managed to shave 400g from the weight of the exhaust tip on the One:1 hypercar by printing it in titanium. Bentley, meanwhile, printed the front grille, side vents and door handles in metal for the EXP 10 Speed 6 show car..

## PRACTICALITIES

So far so good, but how does it actually

**Below:** This is the sort of mid-level 3D printer you might find at a small engineering company.



**Below:** The Stratasys Objet 1000 Plus is currently one of the largest commercially-available multi-material 3D printers.







**Above:** A 3D printed brake duct used for track testing by LMP2 team Strakka Racing.



**Above:** Examples of 3D printed prototype parts – note both the bearing and the spanner are fully functional despite being printed in a single operation.

work? The process starts with a 3D CAD model, which can be drawn from scratch or adapted from a vast library of (sometimes free) off-the-shelf designs. It can also be based on data from a 3D scanner, which allows you to capture the geometry of anything from a solitary wing mirror to an entire body shell in minute detail.

This is something which is already in use with a lot of high-end replica manufacturers and it would lend itself ideally to 3D printing, certainly for smaller items. That said, there's nothing to stop you joining small sections to make larger panels. A car builder in New Zealand is doing exactly that on an Aston Martin DB4 replica where the 3D printed body shell is made from dozens of A4-sized sections glued together.

Once you've got the CAD geometry, the next step is to turn it into a 3D printer-readable format. A lot of CAD packages now have built-in software to do this, but you can also get programs that will convert existing drawings.

There can be a certain amount of work involved in transforming a CAD model of the finished part into a printable file. For a start, any odd

bits of geometry, such as surfaces that don't quite join, will need to be tidied up. Secondly, for most types of 3D printing, you'll need to add temporary struts to support any overhanging structures or areas that might be particularly delicate while the build is going on. Some 3D printers can produce these in a soluble material which is dissolved automatically after printing.

Once the CAD model is ready, all you really need to do is sit back and press go (although, admittedly, you may be there for a while – even relatively simple parts can take hours to process... so take your time over your Corn Flakes).

The beauty of 3D printing is that it allows anyone with a decent grasp of CAD to make parts that would otherwise require a highly skilled fabricator. Because of the way 3D printers work, it makes little difference to them whether they are producing a flat plate or a fully featured model of the Taj Mahal. It's a similar situation with the materials; the same basic principle applies whether you're printing ABS or carbon fibre reinforced

plastic (CFRP) and some printers can handle multiple materials at the same time. You can also produce designs that simply wouldn't be possible with traditional techniques, such as hollow parts with lattice-like reinforcement structures inside.

Needless to say, there are a few obstacles. The first is cost. While hobby printers start at under £500, the professional models go well into the tens of thousands, and you can add another zero to that for a high-end laser sintering machine.

To a certain extent, this upfront investment can be avoided by using printing bureaus. Here, you send the files to a company that will print the parts and ship them back to you, a bit like taking a digital camera's memory card into Boots for your holiday snaps. It's a widespread service and a great way to dip a toe in the water, but costs can soon add up.

The next issue is size. If you want to print a cup holder or a rear view mirror you're in luck, but if it's a complete bonnet panel you're after you better have very deep pockets indeed. Most 3D printers work on a relatively small

**Below:** One-off Morgan SP1 uses printed parts, such as this badge.



**Below:** The central switch panel on this Morgan Aero 8 was 3D printed for the Geneva show.







**Above:** Koenigsegg One:1 uses lightweight printed titanium exhaust tips.

scale and you'll struggle to find anything that can handle parts more than half a metre cube. That said, there are some very big machines out there. Lockheed Martin is said to be working on one for aerospace applications with a 100ft long workspace, while a Chinese firm is attempting to print whole buildings inside a 12-metre cube.

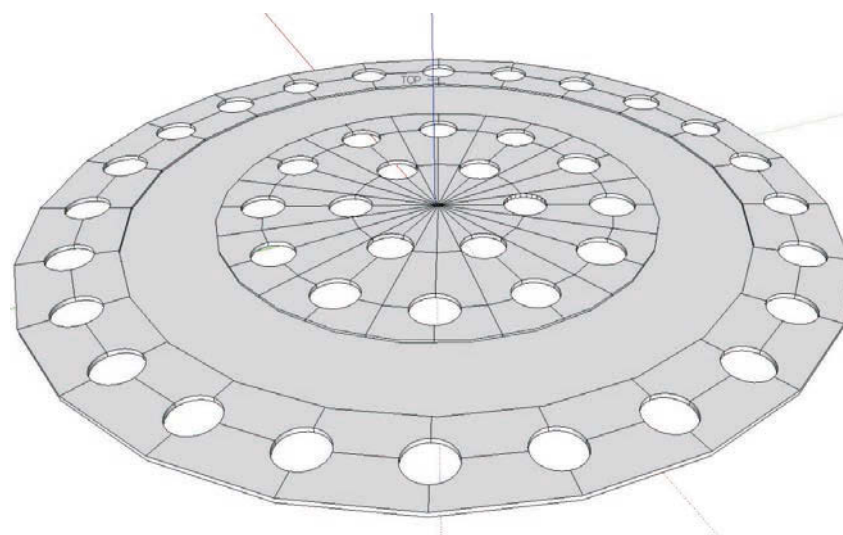
Finally, the materials themselves are a major factor. They've come on in leaps and bounds, but many of the FDM-type processes still result in a relatively weak bond between the layers, which means they're not as strong as, say, an injection moulded part. Likewise, some don't respond well to heat. It's a question of finding the right process for the job and balancing that with cost.

### FIRST-HAND EXPERIENCE

It's not just kit car manufacturers that could benefit from 3D printing, but owners too, as Rob Collingridge discovered while working on his Fisher Fury. Rob is an innovation consultant for BT by day, paid to sniff out new technology, but he has a passion for lightweight sports cars.

"I want to build my next car from scratch, so I've been trying 3D printing out on the Fury," he explains. "It's primarily switchgear and lighting clusters. You can go to Stoneleigh and buy bits like that off the shelf, but I

**"Completely self-taught, Fury owner Rob used a free-to-download package called Google SketchUp and borrowed the office's 3D printer"**



**Above:** Rendering of a rear light array for Rob Collingridge's Fisher Fury produced using Google SketchUp.

wanted something lighter and more bespoke. A big part of the appeal of a kit car for me is that I know that there's nothing out there that's quite the same."

Completely self-taught, Rob used a free-to-download package called Google SketchUp and borrowed the office's 3D printer. Creating the CAD files was something of a learning curve, he admits, but it has opened up new possibilities: "I think the advantage of 3D printing was that I could create things I wouldn't be able to make any other way. Short of being a very skilled fabricator in whatever material you're talking about, it's very difficult to produce something that's aesthetically pleasing as well as functional. On the computer you can radius corners and blend curves into flat surfaces very easily."

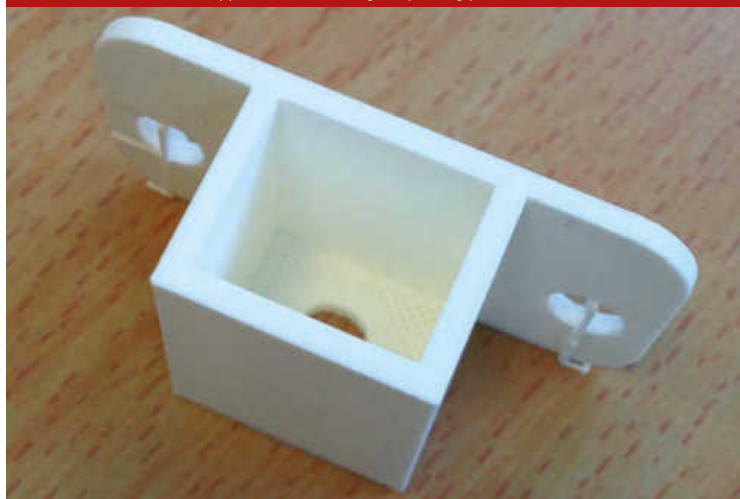
Another advantage he mentions is accuracy. There is no manual marking out or cutting involved for the basic part (although the rough finish did lead to him sanding down the finished items).

"In retrospect, if I was to build the Fury over again I'd use 3D printing a lot more," he says. "I spent hours trying to fabricate brackets out of aluminium that I could have designed and 3D printed so much quicker."

So what does he think the future will hold? "I think the exciting bit will be when it becomes cost-effective to do the larger components. Imagine being able to print wishbones, uprights or brake calipers. If you can get to the point where you can 3D print those it'd be a huge leap forward."

At present, such things are beyond the reach of low-volume manufacturers, let alone home enthusiasts. Even on a budget, though, 3D printing has proved viable for small scale prototypes and low-stressed parts. And if there's one thing that recent history has taught us, it's that technology is advancing at a phenomenal rate. What represents the cutting edge in 3D printing today we may soon look back on like the mobile phones of the '80s – slow, expensive and flawed, but the start of something very big indeed. ■

**Below:** One of the 3D printed brackets on Rob Collingridge's Fisher Fury. Note the support structure in the holes to support the item during the printing process.



**Below:** Rob Collingridge's Fisher Fury, which features many 3D printed parts he has made himself. He plans to build a car from scratch next and will make greater use of the technology.





# Between The Lines

A home for everything  
that didn't make it into the  
main part of the mag.

## Old Sylva documents

It must be the season for clearing out old kit car documents. James Horsley was recently sent some original Nova literature by reader Derek Ring, while Neil Wain has kindly sent in some period Sylva Autokits material that came with the 1988 Striker he recently rebuilt.

The A5 stapled book that forms the build manual has some great hand drawn and annotated diagrams by Jeremy Phillips, backed up by a selection of photos. A cutaway drawing of a Striker is copiously used, instructing readers to "note the unique rocker arms with inboard

coil-spring and damper units... and the novel five-link location of the Escort live axle."

One of the sales brochures dates itself later than 1988 by quoting Sylva's championship wins in 1990, 1991, 1993, 1994 and 1995. It continues: "Like our race customers, leave the other Lotus Seven clones in your wake and choose a totally individual Striker."

There's even a sheet of photos depicting the Striker that *Which Kit?*, the forerunner to CKC, built back in the early 1990s. Delving through those cost most of an afternoon...



## "That's not really a kit car..."

It's strange how some kit cars reach a stage where people are no longer willing to associate them with other self-assembly cars. Someone passed the above comment on the Elva feature in our last issue, as though because the marque had achieved a certain level of recognition it shouldn't really be in a kit car magazine.

It reminded us of the occasion someone came onto our stand at the Goodwood Festival of Speed to say, semi-jokingly, that a kit car stand shouldn't be selling a book about TVRs. It turned out that he owned a 1990s example of the breed. It also turned out that he had absolutely no idea

that TVR started out as a kit car manufacturer.

We wonder whether a similar perception harms Caterham's sales in the kit car market. Kit buyers could be as blind to the fact that you can build your own Caterham as our TVR owning friend was about the heritage of his chosen marque.



## Who'd risk another KTM replica?

We have to admit that the KTM X-Bow GT4 had rather passed us by until we saw one on display on Michelin's stand at Le Mans this year. Very few of the X-Bow roadster's styling cues have crossed over into the little GT racer, but you can see the lineage here and there.

It struck us that a replica of the GT4 would make a great kit car. It would tap into the kit car scene's hunger for track day cars, and bring with it thoroughly modern styling. That said, it would take somebody brave to follow in the



footsteps of Typhoon Sportscars, whose X-Bow replica was quickly stamped out by KTM.

So how about something in the style of the X-Bow GT4, but with its own looks. It can't be impossible...



## To badge or not to badge?

The debate over badging replicas will run forever. When we suggested to Richard Bird of Nubodi Automotive that we'd run the 250 SWB Kalifornia without Ferrari badges, he pitched the view that having a recognisable brand attached to

the car was a big part of the appeal he derived from it. So where do you stand on badging of replicas? Stick 'em on or leave 'em off? Email us your view: adam@performancepublishing.co.uk – one thing's for sure, there's no right or wrong answer!





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